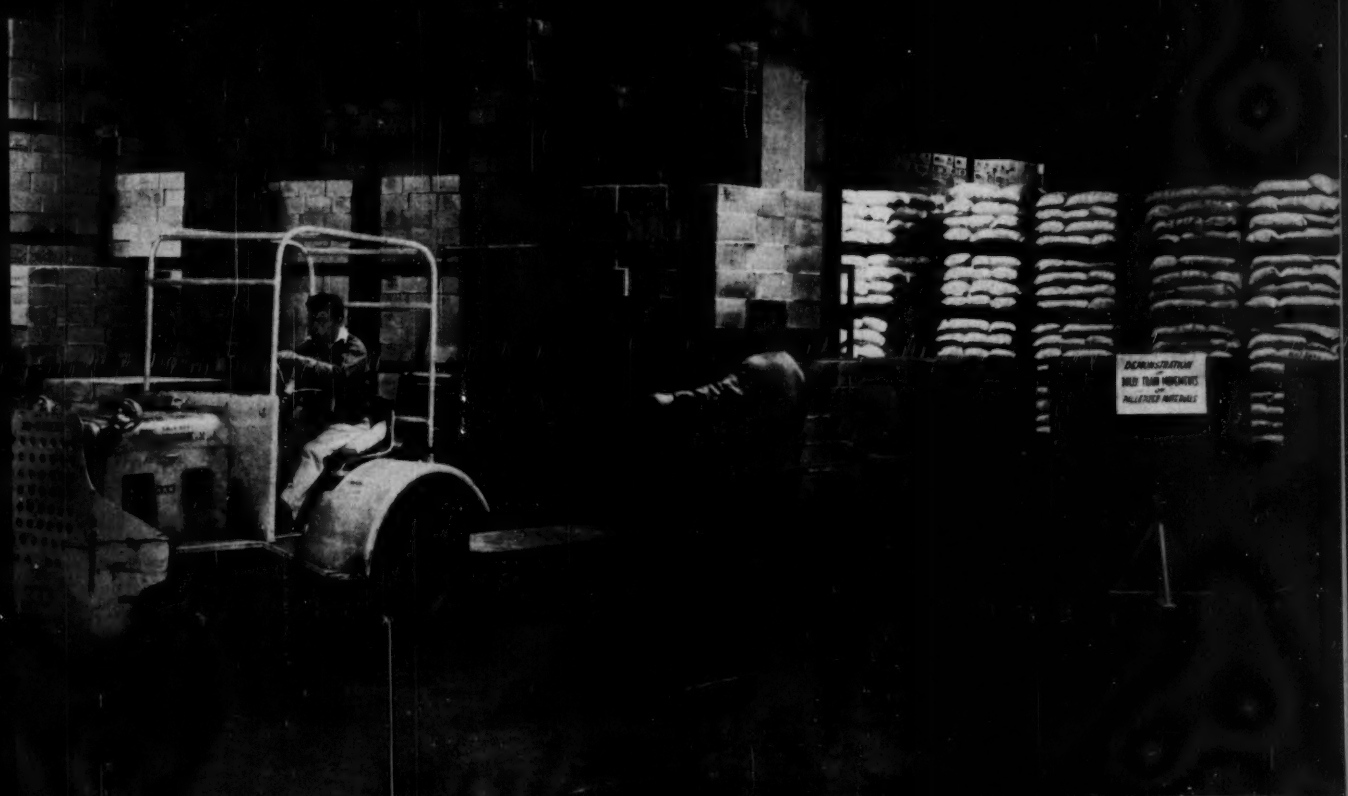
The Magazine of

STANDARDS



The Magazine of

STANDARDS

Formerly Standardization

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MARGINAL NOTES

Chicago's Purchasing Agent —

The fine record of efficient purchasing in the City of Chicago (Government Standards, No. 12, page 217) is due to the efforts of a man who is "known as one of the ablest young executives in the municipal administration." This is what *Purchasing* says of John Ward in its June issue. Mr Ward's picture has the place of honor on the cover of that issue, with a full page description of his career. "Since taking office in 1948, at the age of 36, he has directed the spending of some $300 million of City funds, and has earned for his department a reputation of fair dealing as well as getting maximum value," *Purchasing* declares.

Mr Ward wrote the law on purchasing under which the City of Chicago is now operating.

His department has a world-wide reputation. It has been studied by governmental purchasing men from France, Germany, England, Turkey, Greece, Thailand, Puerto Rico, and Haiti. Mr Ward has been consultant in setting up new purchasing systems in several of these countries.

His achievements have brought him the Distinguished Service Award of the National Institute of Governmental Purchasing and the National Award of the Government Research Association for his "Manual of Governmental Purchasing Procedure."

Standards Engineers —

The two organizations in which standards engineers are taking an active part are rolling up an impressive record of constructive meetings.

The Standards Engineers Society, in which membership is on a per-

ASA
Reg. U. S. Pat. Off.

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Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

sonal, professional basis, is in process of organizing a section in Washington, D. C., as well as in Metropolitan New York, Philadelphia, and the Southern Tier of New York State counties. Color in industry (page 211) was one of the subjects recently featured at meetings of these local groups.

The Society has scheduled a two-day annual meeting at Atlantic City, October 1 and 2 — headquarters, Haddon Hall. There will be a symposium on problems of special concern to companies. At a dinner meeting, awards will be presented to individuals who have made outstanding contributions to the development of standards.

The Company Member Conference is open to representatives of companies that are members of the American Standards Association. Its two-day Spring Meeting was held at Rochester, N. Y., (page 214) with emphasis on round table discussions of problems of special concern to members.

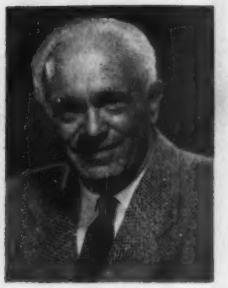
Annual meeting of the Conference will be during the Fifth National Conference on Standards, November 16. With the Committee on Standardization of the National Association of Purchasing Agents, CMC will sponsor an all-day session on purchasing.

Standards Outlook —

If you have missed Leo B. Moore's column of personal comment on standardization that has been a monthly feature during the early part of this year, you will be glad to know that its absence is only temporary. It has been discontinued for the summer months, and will be a regular feature again beginning with the October issue.

The Front Cover —

This demonstration at the Navy's Research and Development Facility, Bayonne, N. J., shows how efficiently and quickly palletized materials can be handled with a dolly train and an industrial truck. *Official U.S. Navy Photo* (U.S. Naval Supply, Research and Development Facility, Bureau of Supplies and Accounts, N.S.D., Bayonne, N. J.)



This Month's Standards Personality

John Ickeringill Crabtree has to his credit important contributions in the processing of photographic materials and development of standards that assure dependable photographic results. Numerous medals and awards from photographic societies in France, Britain, and the USA prove the high regard in which his work is held and the international benefits photography has derived from it.

Born in Clayton le-Moors, Lancashire, England, March 27, 1891, John Crabtree attended Victoria University, where he won honors in chemistry in 1912 and took his Master of Science in 1913. The year following his graduation he became a Fellow of the Royal Institute of Chemistry of Great Britain and Ireland.

His course was directed immediately into the field in which he was to do such outstanding work when in 1913 he joined Eastman Kodak Company. In three years, Mr Crabtree was made head of the Department of Motion Picture Film Developing and head of the Department of Photographic Chemistry. He has held this latter position to the present time. He has been Assistant Superintendent since 1929.

Mr Crabtree has contributed his knowledge and experience to development of standards that have helped give photography the exceptionally pure chemicals needed for good photographic results. The standard techniques and materials that his committee developed have been a factor in making photography the popular pastime it is today.

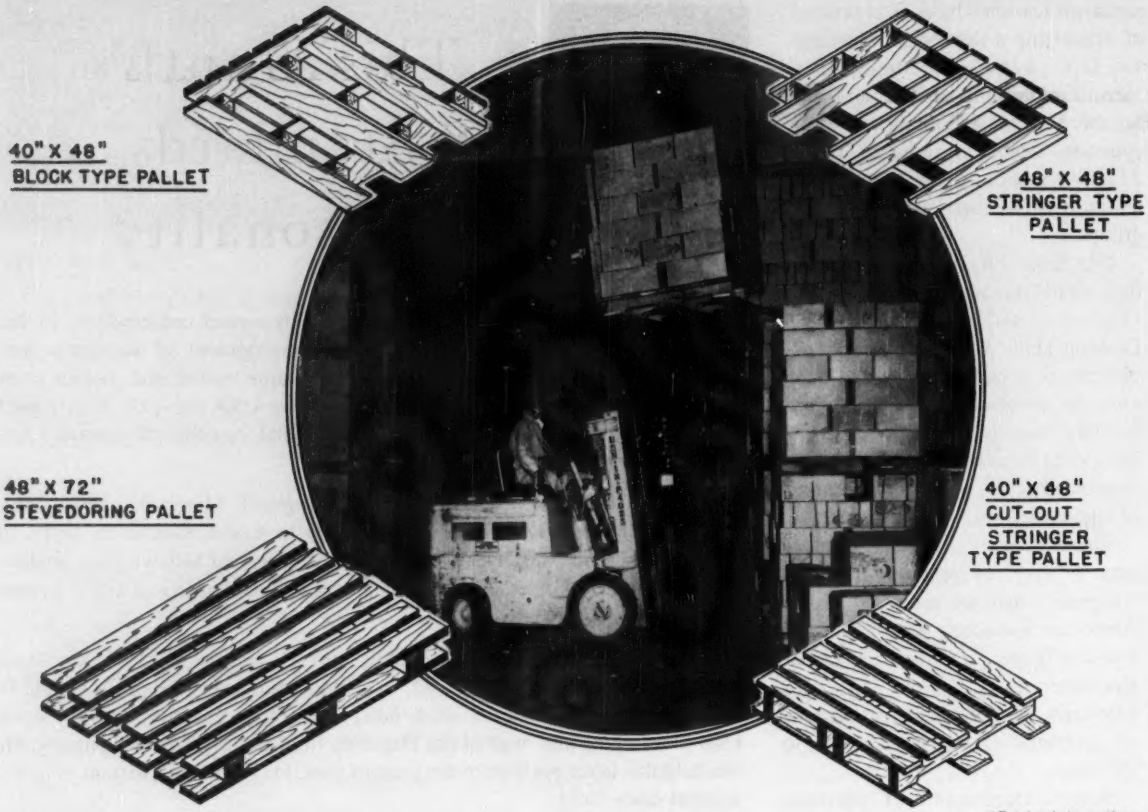
Mr Crabtree has been a member of the ASA Committee on Photography since 1938 and, since its reorganization in 1950 has been chairman of the committee on Photographic Processing, PH4.

He is a member of a long list of professional and technical societies, serving as president of the Society of Motion Picture Engineers (now the Society of Motion Picture and Television Engineers) in 1930-31. He is an honorary member of the Kodak Camera Club; a member of the Royal Photographic Society, American Association for the Advancement of Science, and Photographic Society of America; he is also a member of most of the American chemical and photographic societies, Oval Table Society, and Academy of Motion Picture Arts and Sciences.

In 1924 he was awarded the Progress Medal of the French Photographic Society. In 1944 he received the Henderson Award of the Royal Photographic Society, and the Journal Award of the Society of Motion Picture Engineers. In 1949 he also received the Journal Award of the Photographic Society of America. Again, in 1952, SMPTE honored him with its Progress Award.

Mr Crabtree is author of magazine articles in photographic, motion picture, and scientific journals. He was co-author of a book, *Photographic Chemicals and Solutions,* published in 1929. In 1925, he published a French textbook on the development of motion pictures and a German textbook on photographic chemicals in 1929.

In his spare time he farms — an activity he considers a most satisfactory hobby.



Official U.S. Navy Photo

These different sizes and styles of pallets *have been found by the Armed Services to be useful for different purposes. The 48 x 72-in. stevedoring pallet cuts down number of lifts and thus increases rate of loading ships. The 48 x 48-in. pallet is most efficient in railway cars but inefficient for highway trucks. Recent pallet design for efficient use in both railway freight car and highway truck is a 40 x 48-in. slotted stringer type which permits four-way entry by fork truck and two-way entry by hand pallet jack. Below, a typical wood pallet, shown under load and in use in the photo above.*

Official U.S. Navy Photo

Can Pallets Used in Materials Handling *be Standardized?*

by CHESTER J. HEINRICH

EVER since the time man first discovered he could carry material more efficiently by using a container in addition to his bare hands, there has been a question in regard to what size that container should be. At the present time that same old unsolved problem remains; recently, it has come into increased prominence, although human muscles have been replaced by mechanical power in the carrying of material from one place to another. An attempt to reach a reasonable compromise in regard to most suitable size and weight of a component part of such containers is at present being sought by an American Standards Association committee recently formed. This committee is seeking to adopt standard sizes for "pallets" used with modern fork trucks for the efficient mechanical handling of materials.

The question of proper size of pallets is dependent, of course, upon the commodity being carried, its cube requirements, its weight, and the transportation phases through which it must pass in order to reach its destination in acceptable condition and at minimum transportation and handling costs. A typical wood pallet is shown on the facing page, below; it is shown in use under a load and being carried by fork truck in the photo above.

With the very rapid advance in mechanized handling during the past ten years, a number of sizes of pallets have automatically evolved for use. The armed forces, having an estimated 60 million pallets available, have now standardized on a 40 x 48-in. pallet for general purposes, although other sizes are still being used extensively. The Department of Commerce, in conjunction with food processors, warehousemen, materials handlers, and distributors, has standardized upon a 32 x 40-in. pallet and the 40 x 48-in. pallet for the food trades.

Larger and smaller pallets than those mentioned have been found in use within certain industries for many good and valid reasons. It is believed reasonable to assume that if a statistical frequency curve could be plotted for the sizes of pallets in use at present certain major size tendencies would be duly noted and could be standardized either for certain general transportation usages, or for particular industry practices. Such pallet standardization, in effect, would permit container standardization and also fork truck size standardization to a greater degree, with the many advantages which accrue from a standardization program.

In order to appreciate the limits between which present pallet sizes may vary for particular uses, let us consider the evaluation of the present Armed Service pallet of 40 by 48 in.

During World War II, it was decided by the Armed Services that, since major movements of supplies would be by railroad, pallet sizes would be designed for such use. Accordingly, the 48 x 48-in. two-way entry pallet was accepted. Two 48 x 48-in. pallets side by side in a freight car, with a desirable 2-inch overhang of container on each side of the pallet, amounted to a total width of 104 inches of the pallet load. Since the general average inside width of freight cars is 110 inches, this permitted a tolerance of 6 inches for ease of place-

Fork truck *at Naval Supply Depot handling two pallet loads for tiering*
Official U.S. Navy Photo

Mr Heinrich is Chief Engineer of the Supply Engineering Division, U.S. Naval Supply Research and Development Facility, Bayonne, New Jersey, and a member of the newly organized Sectional Committee on Pallets. Sponsors for this new committee are the Society of Industrial Packaging and Material Handling Engineers, and the American Society of Mechanical Engineers.

ment of the load. Since the pallet loads were placed two tiers high within the freight car, it was found that the 6-inch tolerance for placement ease was just about right for efficient loading and that any efficiency gained by reducing this tolerance would be more than lost in excessive time required by the fork truck operator to "jockey" a load into final position.

When movement of these 48 x 48-in. pallets had to be made by automobile trailer trucks, it was found that such movements were inefficient because the average interior width of these trucks, 88½ inches (maximum outside width 96 inches by certain State Laws), was not sufficient to permit two 48 x 48-in. pallets to be placed side by side. It was, therefore, necessary to load only one line of pallets within the truck, with consequent loss of space and weight capacity of the trucks. A study was made, therefore, in regard to obtaining better efficiency for the use of palletized loads in highway trucks.

The result of this study indicated that the size of pallet best suited for transportation by both railway freight car and highway truck would be a four-way entry 40 x 48-in. pallet with allowable container overhang of 2 inches on both ends of the 48-in. dimension, and 1½ inches on both ends of the 40-in. dimension. When used in the highway truck, a placement tolerance of 2½ inches was found to be entirely satisfactory instead of the 6 inches required for freight cars. This reduction was permissible because pallets are ordinarily loaded only one tier high in highway trailers.

The original design of 40 x 48-in. pallets provided post type construction in order to meet design requirements of four-way entry by both fork truck and hand pallet jack. A recent change provides a more sturdy pallet, by modifying the design requirement to permit four-way entry by fork and only two-way entry by hand pallet jack. This change in design permits use of a slotted stringer type of construction requiring less maintenance costs on pallets.

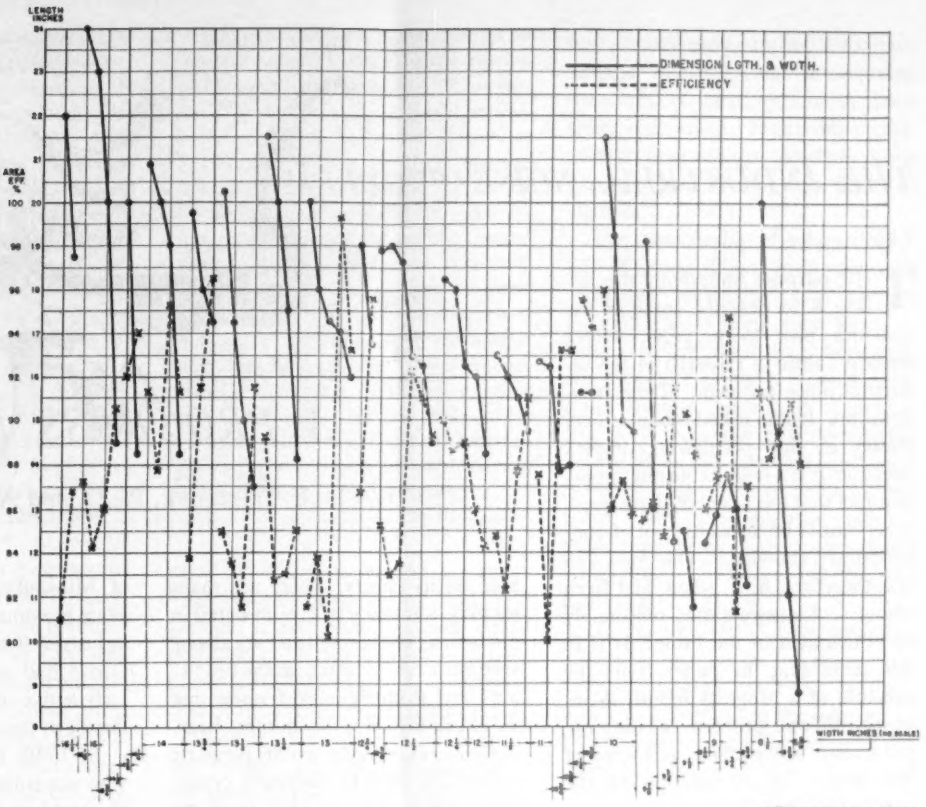
The remaining size of pallet, 48 x 72-in., called the "stevedoring" pallet, as used by the Armed Services, is utilized primarily in the loading of ships where rate of loading is dependent upon the number of lifts into the holds per hour. The greater weight on the larger stevedoring pallet permits more rapid loading, but the larger size pallet cannot be efficiently used in railway freight cars or highway trucks. Greater overall efficiency is usually obtained by use of the 40 x 48-in. pallet, despite any loss of time in loading ships with this size pallet.

Considering pallet sizes other than those used by the Armed Services, a smaller size, the 32 x 40-in. pallet, has been determined by the Department of Commerce and interested industry to be the size best adaptable to the needs of smaller retail merchants for the receipt of palletized loads. In this case, quantity of order is a governing factor which must necessarily be given consideration. Another branch of industry utilizing the smaller type of pallet is the fire brick industry, wherein desirable maximum weight loads of 1800 to 2000 pounds are obtained on pallets smaller than the 40 x 48-in. pallet. Ordinarily, a 40 x 48-in. pallet is best utilized for commodities averaging about 38 pounds per cubic foot. Where heavier materials are being handled, the usual tendency is to decrease the size of pallet until a desirable pallet load cube is reached, which will weigh approximately 2 thousand pounds. Conversely, industrial users of pallets carrying commodities considerably lighter than 38 pounds per cubic foot will usually tend to use a larger size pallet until again their desirable load cube is reached, which will weigh about 2 thousand pounds. One typical example of a user of larger pallets who has a problem of light weight in regard to cube is an electrical manufacturer who uses 58 x 58-in. pallets. The light weight of his output product, such as light bulbs, fluorescent bulbs, and fixtures, etc, does not permit him to utilize efficiently a smaller pallet for his movements within his own plant. He may, however, either repalletize on a 40 x 48-in. pallet for commercial shipment or ship unpalletized.

It is considered desirable to maintain a pallet load at approximately 2 thousand pounds total weight due to the following facts: the fork truck having the actual capacity to handle this size of load is usually the most economical in regard to operating expenses, it is small enough to utilize minimum operating aisle widths within storage activities; and it is also small enough, light enough, and flexible enough to work efficiently in highway trailer trucks and railway freight cars. Contrary to what might be expected, the rated size of the fork truck usually utilized to effect movements of the 2000-pound pallet load, is a 4000-pound fork truck rated with center of gravity of load at 24 in. from heel of forks. Although a fork truck rated at 2000 pounds will usually permit lifting of its rated load to maximum fork height capacity if great care is taken, practical operating conditions usually limit lifting the rated load of a fork truck to a height of one tier, approximately 48 inches. Lighter capacity loads are progressively lifted to maximum tiering height, until the load, safely raised to maximum height under practical operating conditions, is approximately half of the rated load. Although fork truck sizes have been fairly well standardized by the truck manufacturers, it is believed that standardized pallet sizes would permit further opportunities for fork truck standardization.

One of the more important possibilities which could result with standardization of pallets is standardization of the container sizes which would be used on these pallets. At the present time, most manufacturers

"As Lord Woolton, a former President of the British Standards Institution, has said: 'Standardization ensures the maximum of value per unit of price, and affords the consumer full protection in guaranteeing a minimum standard of quality and performance.' Standards enable the buyer to know what he is getting and to obtain what he wants. They secure the mutual satisfaction of buyer and seller."—*Fifty Years of British Standards.*



Official U.S. Navy Photo

A study *of pallet patterns (on a 40 x 48-in pallet) as indicated in the Navy Department's publication NAVSANDA No. 269 shows striking variations in efficiency of pallet use which occur with changes in container sizes.*

purchase containers merely to fit the outside dimensions of their product, with little thought being given to placement of these containers efficiently in a proper pallet pattern upon the pallet. Since the length and width combination dimensions of a container should add up to 43 x 52-in. for a 40 x 48-in. pallet, permitting total container overhang of 3 inches and 4 inches as previously discussed, any variation from such total figures may result in lower efficiency in the utilization of total available cube in the formed pallet load. Often, small changes in overall dimensions of the product would result in lower costs of distribution, through more efficient use of space and capacity already available during the storage and handling cycles.

Considerable work on container standardization has already been accomplished by the Department of Commerce in cooperation with food distributors. Despite such work, approximately 134 different sizes are at present recognized as standard food sizes. In a recent study made to determine the efficiency of such container bottom dimensions, the best pallet patterns were worked out to give maximum stability of load, utilization of space, etc. It was found that the efficiency of the bottom dimensions alone ranged from 99.2 percent down to 80 percent in regard to available use of pallet area, which further directly influences efficiency of warehousing and handling. A plot of these container size efficiencies as utilized in proper pallet patterns for 40 x 48-in. pallets is given in the chart above.

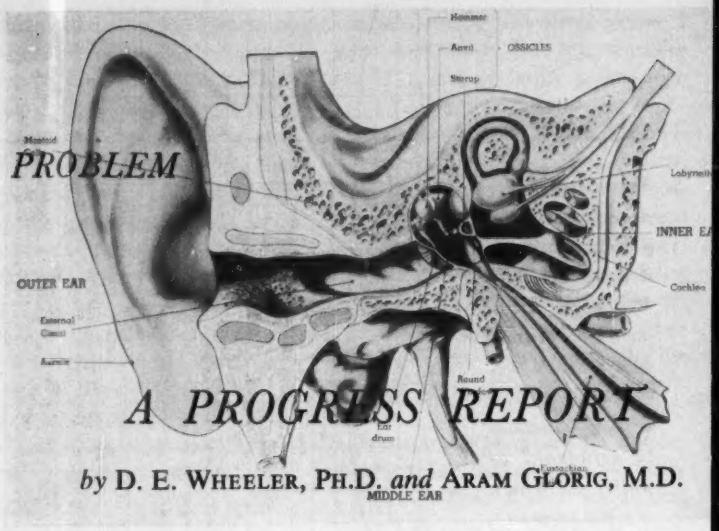
There is a possibility that serious study of container sizes, as related to standardized pallet sizes, could indicate optimum container sizes and families of container sizes which might be efficiently used interchangeably with standardized pallet sizes once they are established.

Although the standardization of container sizes is believed, by the writer, to be of major importance at the present time, it is also recognized that standardization of component parts of pallets is necessary. Since the great majority of pallets at present are wood pallets, complete specifications for the wood, including acceptable species, allowable defects, moisture content, type of construction, etc, and also detailed specifications for pallet fasteners, such as drive screw nails, clinched nails, and bolts, should be provided. The Armed Services have done considerable work in this direction and have evolved specifications for their use, acceptable to both users and suppliers.

Although of somewhat lesser importance, pallets made of steel should also be standardized. Because of the great diversity of design being used at present, possibly the specifications for these pallets should be of a performance type. There is a possibility also that Expendable Pallets should be considered in like manner, since a total of at least 29 different designs are now being furnished by manufacturers.

In addition to the many economies which would result from the adoption, nationally, of standard pallet sizes, savings could also be obtained on international shipments. Despite the many reductions in efficiency due to the fact that existing cargo ships

(continued on page 224)



THE INDUSTRIAL NOISE PROBLEM

A PROGRESS REPORT

by D. E. WHEELER, PH.D. *and* ARAM GLORIG, M.D.

THE purpose underlying this article is to describe some of the activities now in progress, whose general nature is research in the industrial noise problem. Many questions are being asked about many phases of this peculiarly complex question. It is a regrettable but important fact that too many of these questions cannot be answered out of contemporary knowledge. One may well ask, therefore, how, when, and from whom such answers may reasonably be anticipated in the future. It is in this sense that the paper bears the sub-title of a progress report. Work in this difficult problem is going on, progress is being made, and some of the sources of information on the subject are given below.

Historical Background

Among the many health problems affecting the industrial labor force, excessive noise exposure is one of the oldest hazards. Its effects were first detected in the form of hearing loss. Trades in which high-level noise was regularly produced were noted and have been mentioned repeatedly in medical literature since early in the last century. Blacksmithing, boiler making, weaving, and railroading were among such trades. The use of firearms was also known to have some connection with hearing loss. Modern industry has added more diversified noise generators and, in certain instances, has increased both the levels to which workmen are exposed and the number of workmen exposed.

Noise is unwanted sound, by definition. Although common industrial noise may have other physiological effects, an hypothesis which still awaits solid evidence, it can and does produce hearing loss in some people. One may rightfully ask why, if the problem is an old one, so little scientifically reliable information is available on its effects? There are many reasons, too many to give in detail in this article, but certainly a very strong argument can be rested on the following facts: Both the hazard, noise, and its physiological concomitant, hearing loss, are complex events properly measurable only by electronic equipment which did not exist until the middle twenties of this century. The gross facts were detectable by human observation; verification of even the simplest quantitative relationships, however, depends upon proper measurements with suitable equipment.

The Work of the Subcommittee on Noise in Industry

The problems of diagnosis raised for the physician (who must distinguish between noise-induced hearing loss and that loss due to many other possible causes) have become increasingly a matter of concern to the physician. The American Academy of Ophthalmology and Otolaryngology, which represents the largest organized group of ear specialists in the world, maintains a standing Committee on Conservation of Hearing. This committee has, since its establishment, concerned itself with the prevention of hearing loss, wherever possible, and with the techniques of hearing conservation in both children and adults. From the membership of the Committee on Conservation of Hearing, a Subcommittee on Noise in Industry was set up in 1946. Its first chairman was Dr W. E. Grove, of Milwaukee, who had for many years previously been concerned with industrial hearing loss problems; Dr Grove had personally been particularly active in attempting to alert industry to the noise problem.

In 1950, Dr Howard P. House,[1] who was equally well acquainted with the problem, took over the chairmanship of the subcommittee. Under his able and active leadership, the work of the subcommittee has continuously expanded. At the present time, the subcommittee maintains a full-time research staff headed by the Director of Research. Dr House is continuing as chairman and the subcommittee has added to its roster other nationally known experts in this field.

The subcommittee considered its task to have two major divisions. The first of these was obviously to relate the emphasis of its parent body, the Committee on Conservation of Hearing, to the special circumstances of industry. The preparation of guides and manuals was undertaken and these materials have been continuously disseminated to industry. W. F. Scholtz,[2] in a recent article in *Connecticut Industry,* has given a complete description of the manner in which these recommendations were translated into industrial practice.

[1] Howard P. House, M.D., 1136 West 6th Street, Los Angeles 17, Calif.

[2] Scholtz, W. F., Combating the Effects of Noise, *Connecticut Industry,* March 1954. Connecticut Manufacturers Association, West Hartford, Conn.

The recently published report on the effect of noise on industrial workers (The Relations of Hearing Loss to Noise Exposure, by Exploratory Subcommittee Z24-X-2, published by ASA) has aroused considerable interest. It showed that more information is needed before standards can be developed for acceptable noise levels and exposures. In the meantime, members of the subcommittee that issued the report have analyzed the work now going forward. Their analysis is published here.

Dr Wheeler is field representative, Subcommittee on Noise in Industry, Committee on Conservation of Hearing, American Academy of Ophthalmology, and Otolaryngology. Dr Glorig is Director of Research for this group.

Early in April, a Working Group on Standards and Methods for the Testing of Hearing of ASA Sectional Committee Z24, Acoustics, developed a preliminary report on the present American Standard reference for 0-db hearing loss. The report was presented to the Committee on Hearing and Bio-Acoustics recently organized by the Armed Forces and the National Research Council. It recommended that the work of the Acoustics Section of the National Bureau of Standards on audiometric standards be continued. It also recommended a number of studies on ear-canal pressures, on the population to be sampled, and on use of different instruments for measurements of threshold hearing and ear-canal pressures.

The second division was the accumulation of data drawn from industry, upon which the quantitative relationships of noise exposure and hearing loss could be based. The subcommittee anticipated that such a task could not be completed speedily, and indeed, it has not been. A field representative to the subcommittee was appointed to collect such data. For nearly five years, the research aspects of the work have been in progress and a solid groundwork has been laid with cooperating industrial plants. It must be emphasized that all members of the subcommittee have given generously of their time in writing to appropriate industrial personnel, talking at meetings, delivering papers and preparing materials. In later years, military facilities have been added to the cooperating agencies, as well as certain Federal institutions, such as prisons. Wherever noise is generated and men are exposed to it, there exists an opportunity for measurement and for the accumulation of data from which quantitative relationships may be deduced.

The American Standards Association and Subcommittee Z24-X-2

Subcommittees of sectional committees of the American Standards Association are frequently set up to investigate problems in which standards may be involved. In 1951, the Sectional Committee on Acoustics, Vibration, and Mechanical Shock, sponsored by the Acoustical Society of America, authorized the appointment of a subcommittee to study "permissible, objectionable, and injurious noise levels." When duly constituted, this subcommittee, designated Z24-X-2, began its investigation of the subject under the heading "Bio- and Psycho-Acoustic Criteria for Noise Control." Exploratory committees, such as Z24-X-2, usually have a nominal life of two years, at the end of which period a report is delivered to the parent committee. Because the problem was understood to be a difficult and time-consuming one, Z24-X-2 concentrated its study upon that aspect which seemed to offer promise in terms of data already in existence. Two things were needed, the spectra of noise to which men had already been exposed for known lengths of time, and audiometric measures of hearing loss in these same individuals. From these data, certain relationships between noise exposure and hearing loss could be studied.

The membership of subcommittee Z24-X-2 was drawn from scientific, technical, industrial, and medical groups. The desired data were, in some part, delivered by subcommittee members or were located from other sources known to members. The very necessary and difficult task of rounding up, selecting, and analyzing the data, and of deducing the facts which subsequently emerged from it was given the subcommittee's Technical Counsel, Dr Wayne Rudmose.

During 1952-1953, Subcommittee Z24-X-2, meeting in full session on several occasions, reviewed the findings and agreed upon the interpretations possible within the scope of the data. It was clear that, from the amount of information then available, no standard or standards could be written. The findings of Subcommittee Z24-X-2 were submitted to the American Standards Association and published under the title, "The Relations of Hearing Loss to Noise Exposure." This report is available from ASA. All persons interested in, or concerned with, the industrial noise problem are urged to include

Noise level *of drill press operation is being checked here with a sound level meter.*
General Radio Corp

this document in their libraries of publications in this field.[3]

Subcommittee Z24-X-2 did not suggest standards or propose criteria. It regarded its assignment as a fact-finding mission. An intensive search for facts was made and it is not to be doubted that all appropriate data then available to the subcommittee were utilized. The report contains a number of findings which are of immediate interest to industry. Had the facts justified the proposal of criteria or the writing of standards, these would have been done. Readers of the report may well examine carefully the reasons, given in detail, why contemporary data are insufficient for standards, as well as the outline of procedures which would make sufficient data available in the future.

The Armed Forces and the National Research Council

In the production of very high noise levels, the Armed Forces probably contribute the major share. It must be understood, however, that the military services employ large numbers of civilians working on conventional industrial processes. The noise problem for the military services is, therefore, all-embracing and a matter of concern. Here, as elsewhere, the need for research is well understood.

Recently, the Armed Forces and the National Research Council set up a Committee on Hearing and Bio-Acoustics, currently known as CHABA.[4] This committee is acting as a consulting body to the Armed Forces and to any civilian organizations whose relations with the government fall under hearing and bio-acoustics. CHABA functions as a clearing-house of information and research under these headings. The CHABA committee is constituted with a council of nine members acting as the executive head to the full committee of experts chosen from many fields and many disciplines capable of contributing to relevant problems. The operation of the committee is based on working groups. These groups are picked to pursue the solution of a specific problem. Each working group meets whenever necessary at the discretion of the working group chairman until the particular problem is settled. Problems currently considered range from those requiring several years to those which may be settled by a mail vote within a matter of months.

Several of these working groups have reported on the jet engine noise problem. Data were collected from field trips and from experimental research aboard aircraft carriers and at military field facilities. Under CHABA, a working group has surveyed the entire country to determine what facilities, specialists, and equipment were available for service in studying the military noise problem.

General Radio Corp

Meter *gives official data on street noise.*

It is clear that CHABA now serves to stimulate interest in the attack on the noise problem, both civilian and military. CHABA is materially assisting in directing research efforts into controlled and organized channels. As a result, the economical employment of time and effort should yield large dividends in the form of reliable information speedily disseminated.

Noise Control

The emphasis throughout this article has been upon the need for more data. Many organizations and individuals have a keen interest in this problem and are approaching it according to the disciplines they represent. This discussion would be incomplete without mention of the excellent work now being done in the acoustical engineering field, work which can best be summarized as noise control. The most obvious solution of a problem involving an industrial hazard is the elimination of the hazard itself. Much can be done and is being done along these lines. But engineers need design objectives, particularly in the noise problem whose control may often represent great expense. The primary design objective in noise control is the provision of safe working environments for human hearing. It is here that the need for data becomes acute. Until we know how much noise of what kind is safe for how long a time, the problem can have only a partial solution, for the answer depends upon hearing loss measurements.

Summary

1. Since 1946, the Subcommittee on Noise in Industry has maintained an organized effort directed at hearing conservation in industry. The accumulation and analysis of research data has been, and still is, a major activity of the Subcommittee.

2. Subcommittee Z24-X-2, in a well planned and coordinated program, examined contemporary data in a search for possible criteria. Its report does not contain criteria or suggested standards, but does provide facts of immediate importance to industry.

3. The creation of the Committee on Hearing and Bio-Acoustics provides a national agency able to call on many disciplines and specialties for all phases of the noise problem.

4. The Subcommittee on Noise in Industry, with its full-time research staff, is expanding its efforts to collect and assess data on hearing loss under known exposure conditions. Cooperating with other organizations, such as those described above, the subcommittee hopes to continue the regular collection of this information, the analysis of which will ultimately supply the medical profession, industry, courts and legislatures, and standards groups with the data necessary to resolve the problem.

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[3] Those familiar with voluntary committee work will recognize the magnitude of the task carried out by Z24-X-2. All members contributed fully, but the excellence of the finished work must, in no small measure, be attributed to the keen insight of the Subcommittee chairman, Professor W. A. Rosenblith, and to the untiring efforts of the Technical Counsel.

[4] Dr Hallowell Davis, Executive Secretary, 818 South Kingshighway, St Louis 10, Missouri.

The Need for Standardization of Industrial Colors

by WILLIAM J. KIERNAN

WHY do we need standardization of color? Let us consider that the human eye can distinguish about 10 million shades, tints, and tones of color. Our whole concept of mass production, which relies upon the limitation of parts and processes, would collapse if we did not limit the use of colors to a very small fraction of what we can see.

This limitation may be approached from several directions. One is from the aesthetic viewpoint, i.e., the satisfaction of a customer's whims and tastes; the other is the opposing industrial viewpoint which requires standardization and limitation of product. Industry may also use color for the control of manufacturing processes, and for factory safety.

A customer may wish to match a piece of fabric or wallpaper to another piece of merchandise. To satisfy the customer with an acceptable match in color it is evident there must be some limitation of the number of colors commercially used.

Usually a customer describes color in terms that give one a vague visual impression of color and an even vaguer acceptable tolerance for the color, such as by defining it as light red or dark brown. To satisfy this customer, one must have standardization in the form of limitation of a selected group of colors pre-established by industry in such a manner as to lead the consumer into this type of standardization unknowingly.

How does one ordinarily obtain standardization? Primarily, standardization of color first originates in the results of opinion surveys to determine consumer or industrial prefererence. There are many organizations that specialize in making these surveys. Naturally the selection of standardized colors is not always what the manufacturer would prefer but it usually results in a standardization of a limited number of colors that will sell best to the consumer. The day of the Model T and Henry Ford's statement that "A customer can have any color as long as it is black" is gone forever.

This discussion on standardization will reveal the efforts of the trade associations, the American Standards Association, the American Society for Testing Materials, and the National Bureau of Standards to standardize color as employed in consumers' products and in industry.[1]

Perhaps one of the most outstanding standardization efforts was the joint action of the National Retail Dry Goods Association in collaboration with the National Bureau of Standards to produce Commercial Standards CS 62-38 and CS 63-38, colors for kitchen and bathroom accessories. Ten porcelain standards are available from the National Bureau of Standards.

The National Bureau of Standards, in collaboration with the Plastic Materials Manufacturers Association, has also brought out two Commercial Standards, CS 147-47 and CS 156-49, which illustrate a range of standard colors for molded urea and polystyrene plastics.

One of the most successful methods of standardization has been the effort of the various textile and asso-

Bell Laboratories Record

The author *and an assistant are shown calibrating a meter for color differences with a light-gray porcelain standard used by the Bell System in its own operations.*

Mr Kiernan is with Bell Telephone Laboratories, Inc, Murray Hill, N. J. He presented this paper before the Standards Engineers Society, Metropolitan New York Section, January 13, 1954, and before the Metropolitan Philadelphia Section, April 26, 1954.

[1] See also Deane B. Judd, Color in Business, Science, and Industry (1952). John Wiley and Sons, Inc, New York.

ciated industries to standardize on colors through the organization known as the Textile Color Card Association of the United States. There is a standards book which illustrates the colors commonly used from year to year. Seasonal cards are issued to illustrate the colors of shoe leathers, hat felt, gloves, hosiery, rayons and woolens, etc. These color cards are employed by textile manufacturers, milliners, hosiery manufacturers, shoe manufacturers, and women's accessories manufacturers. The average woman probably does not realize that the ease of obtaining various items of her spring or fall outfit in matching or harmonizing colors all springs from pre-established standardization.

One of the most productive standardization efforts of the Government in recent years was the color book, Federal Specification TT-C-595, Colors (for) Ready-Mixed Paints. By means of these standard colors in gloss, semi-gloss, and lusterless groupings, manufacturers are enabled to supply a limited number of colored paints and associated materials to the many branches of the federal government with resultant economy to the taxpayer. Before this color book was issued, each branch of the Government had its own color requirements for paint systems.

Other interesting examples of standardization are the National School Bus Chrome, the standard yellow for highway signs, and the standardization of wood furniture colors by the National Paint, Varnish, and Lacquer Association.

Some of the standardization efforts accomplished through the American Standards Association are as follows:[2]

Scheme for Identification of Piping Systems, A13-1928 R 1947

Building Exits Code A9.1-1953 (NFPA 101; AIA 40-B-7)

Industrial Accident Prevention Signs, Specifications for, Z35.1-1941 R 1945

Color Codes, Numerical Values, Decimal Multipliers, and Tolerances for Components for Electronic Equipment, C16.14-1947 (RMA GEN-101)

Marking Cylinders for Compressed Gas, Z48.1-1954

Safety Color Code for Marking Physical Hazards and Identification of Certain Equipment, Z53.1-1953

Gray Finishes for Industrial Apparatus and Equipment, Z55.1-1950

Of these specifications, the most interesting are the standardization of industrial gray colors and the color codes for marking electronic components. For some time the only standard gray that was used to any extent in industry was the so-called machine tool gray standardized by the National Machine Tool Builders' Association. However, this was only used to a limited extent. Consumers of switchgear, motors, and associated equipment usually found that such items purchased from the Westinghouse Electric Corporation, the General Electric Company, or similar electrical supply companies probably would not match. Consequently, in order to maintain a uniform appearance of associated equipment, it was necessary to repaint. These corporations believed that joint action of the representatives of companies making electrical equipment through the American Standards Association would probably remedy this situation. As a result of the work of Committee Z55, four standard gray colors were established and are now widely used in industry.[3] One of the four gray colors is the machine tool gray previously mentioned. The ASA 33 gray is now used in the telephone industry on PBX's, telephone answering devices, and several items of radar equipment supplied to the armed forces. The other example which I had mentioned is the decimal equivalent system set up for marking electronic components. This, again, is universally used by all manufacturers of electronic components. You can see the obvious need for standardization when you realize that a piece of radio or television equipment might be repaired in any section of the country and defective parts may be replaced by interchangeable parts not necessarily made by the original manufacturer. The repairman can easily determine from the color code what the electrical characteristics of the defective part are and can consequently choose a replacement part.

The armed forces have also carried on color standardization in their military specifications, which in some cases are almost identical with the American Standard Specifications. Some examples are as follows:[4]

MIL-STD-101 Color code for compressed gas cylinders and pipe lines

MIL-STD-104 Limits for electrical insulation color

MIL-STD-122 Color code for chassis wiring for electronic equipment

MIL-STD-221 Color code for resistors

Finally, in the description of standard colors, let us not forget to mention the standardization of American Railroad Signal Colors and the Colors for Aeronautical Lighting.

Another broad class of color standardization is the determination of acceptability of product by comparison to visual standards. These are practically unlimited in scope, but the following names and describes some of the more commonly used standards:

1. Paint pigment samples devised by the National Bureau of Standards to illustrate acceptable colors of paint pigments. About 29 pigments are described.

2. Standards for grades of raw cotton developed by the U.S. Department of Agriculture. Twelve standards are available which in turn can be used for identifying 33 grades.

3. Forty-one inks for maps developed by the Army Map Service Corps of Engineers.

4. Standard colors of tag stocks developed by the Tag Manufacturers Institute. Seventeen classes are covered.

5. Standards for raw silk developed by the National Hosiery Manufacturers Association.

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[2] Available from the American Standards Association, 70 East 45th Street, New York 17, New York.

[3] H. W. Robb: Mixing or Matching "Standard" Grays Now Available. STANDARDIZATION, Vol 21 No. 9, Sept 1950, p 234-235.

[4] Available from Superintendent of Documents, Government Printing Office, Washington, D. C.

6. U.S. color standards for rosin covered in ASTM D365-39T, and consisting of twelve types.
7. Permanent glass standards for maple syrup developed by the U.S. Department of Agriculture.
8. Liquid standards for grades of honey developed by the U.S. Department of Agriculture.

Another phase of color standardization is the perception of color differences as a means of control of atmospheric impurities, for chemical analysis, etc. These methods in many cases overlap those previously described. Some examples are:
1. Humidity test charts per AND 10376 used for determining the color change of cobalt salts on silica gell when exposed to humidity.
2. The Bureau of Mines standard charts for grading the density of smoke. Four charts are available.
3. Carbon monoxide indicator papers used in manholes to determine whether the atmosphere is polluted.
4. Lovibond glasses which are used to determine the color of lubricating oils, paint vehicles, vegetable oils, sugar solutions, and beer.
5. Union colorimeter per ASTM D155-45T using 12 glass standards for determining the color of petroleum products.
6. Hellige glass standards used for determining the color of varnishes and also to determine acidity or alkalinity with certain indicators.
7. The FAC color standards consisting of 26 solutions of inorganic salts developed by the Fats Analysis Committee of the American Oil Chemists Society for color grading of tallows and greases.
8. Color standards for McIntosh apple leaves issued by the Cornell University Agricultural Experimental Station to determine if the correct amount of nitrogen fertilizer is being used.
9. Color standards for determining the correct ripeness of tomatoes issued by the U.S. Department of Agriculture.

It should be noted that most of the items previously discussed show that a visual standard has been produced in order to illustrate the desired color. The big problem comes when one seeks to determine whether the product that he makes or buys is an acceptable commercial match to the visual standard. Several books of color are in common use which may in some cases be used for setting up color tolerances. Some examples are:

Munsell, *Book of Colors*

Maerz & Paul, *A Dictionary of Color*

Container Corporation of America, *Color Harmony Manual*

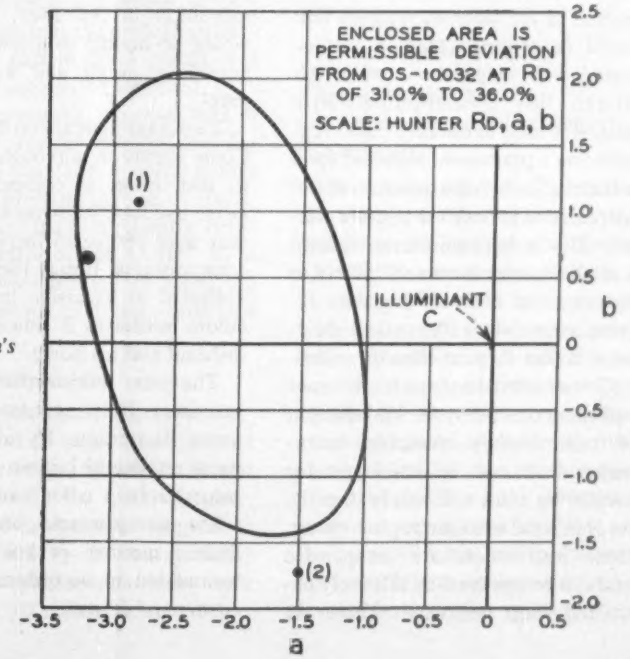
Robert Ridgway, *Color Standards and Color Nomenclature*

Villalobas, *Color Atlas*

It is obvious that considering that the human eye can see millions of colors, no book of colors can more than scratch the surface; therefore, if one is forced to determine the degree of match to a standard, it is usually necessary either to prepare visual standards outlining the limits in color space or go to the use of instrumental devices such as spectrophotometers or colorimeters. As part of the standardization of color in industry, most industrial organizations, in their modern color control efforts, have gone to instrumental means of controlling the color of their product.

As recently as 25 years ago, most of the apparatus and equipment used in Bell System central offices was painted black.[5] This made these offices appear dark and somber and, together with the limited amount of reflected light from artificial or natural sources of illumination, made them difficult to maintain, since dust and lint that might interfere with relay operation were not readily visible. Later, to improve maintenance, it was decided to replace the black by aluminum finishes. At the beginning of World War II, however, the use of aluminum pigment was greatly restricted and light gray finishes were adopted as a temporary replacement. These lighter finishes so enhanced the appearance of the central offices, and were so widely favored, that it was decided a few years later to continue their use on a permanent basis. The increased use of color led to problems in color control that did not exist when black or aluminum finishes were used. It was found necessary to insure that successive lots of a particular paint or finish were actually the same color to within predetermined tolerance limits. Adequate color control is always difficult to obtain, and this difficulty is increased in the Bell System since individual pieces of its apparatus and equipment are manufactured and finished in many widely separated plants and factories. The effect of good color control is primarily esthetic but, as experience has shown, uniformity of color leads to good house-

[5] Kiernan, W. J., Color Control in the Bell System, Bell Laboratories Record, Vol XXXI, No. 10, Oct 1953, pp 375-379.



Tolerance *graph for light gray used in Bell System's central office*

keeping, and is an evidence of pride in good workmanship.

The first attempts to control color in the Bell System were based on visual methods of matching colors, and also their gloss and texture, to an appearance standard. In some applications, a single standard of the desired color was employed; in others, the single standard was supplemented by additional standards establishing light and dark limits. Visual methods of control have never proved to be entirely satisfactory, however, since the standards are never permanent, and judgments as to whether a commercial match to a standard exists depend upon the past training and physiological characteristics of the observer.

There are two problems that must be solved to achieve more adequate color control: first, a permanent master standard must be established against which all other standards can be checked; and second, an instrumental means of measuring color must be devised that can easily be applied to shop inspection and control practices.

The permanent standards for colors used in the Bell System consist of physical measurements made with a spectrophotometer. This instrument records the amount of light of each wavelength in the visible portion of the spectrum reflected from the sample, as compared to the amount of the same wavelength that would be reflected from a surface coated with magnesium oxide. Although this spectrophotometric method is used to obtain a curve representing a permanent standard for a particular color, the process is not adaptable to general use in color control. This is because the instrument is relatively expensive and difficult to operate, and the resulting data require extensive mathematical treatment before they are directly usable.

Color control has been made easier and more precise by the introduction of commercially available instruments that can be employed for measuring color differences directly. As compared to a spectrophotometer, these instruments are inexpensive and can be operated by relatively untrained shop personnel. There are variations from one instrument to another, however, and any one instrument may vary from time to time as a result of temperature changes, the condition of the light source, and the age of the photo cells. It is necessary, therefore, to use them as color difference meters rather than as accurate color meters. To obtain maximum precision, the instrument must be recalibrated before each color measurement with a relatively permanent porcelain color standard similar to the color to be measured. The color measurement is usually obtained in terms of three variables obtained directly from the instrument. These values are then plotted on a tolerance graph to determine the conformance to the pre-established permissible tolerance. Specifications are provided for each Bell System Color Standard, describing that color in terms of a master-standard spectrophotometric reflection curve. A tolerance graph for use with the color difference instrument is included in each specification.

Future Color Standardization

Standardization and consequent limitation of colors seems almost inevitable as our mass production economy develops. In industry and many phases of consumer life this may be very desirable. But let us hope that standardization as it relates to limitation does not lead to regimentation in our lives, where we would be limited to a few colors of household goods and wearing apparel.

Two good signs are on the horizon. Color television, although limited in its own range as compared to the range available in pigment and dyes, may lead people to increased color consciousness. It may therefore be a deterrent to excessive limitation of colors insofar as it concerns the individual and his home.

The paint industry has tended to get away from standardization in home decoration. By allowing the paint retailer to custom-make paint colors from a color bar employing a few paint primaries, an almost unlimited number of colors can be formulated in accordance with the customers' desires.

Rochester—

ONE hundred twenty-five guests and members of the Company Member Conference were welcomed by Norman Kreckman, Vice Mayor of Rochester, at CMC's Spring meeting in Rochester, N. Y., May 10 and 11, 1954.

Arrangements for the meeting were handled by a local committee of which E. Philip Kron, Eastman Kodak Company, was chairman. Plant tours to Bausch and Lomb Optical Company, Eastman Kodak Company, the Gleason Works, the Taylor Instrument Company, and the Pfaudler Company were part of the program.

The two days were devoted almost exclusively to a study of the organization of a company standards department, actual savings in dollars and cents, and various other benefits of company standardization.

Topics of discussion included: Mechanics of company standardization; decimal sales; can you hang a dollar sign on standards?; how American Standards are born; the use of material standards by the purchasing agent; nuts and bolts; and knowledge and use of American Standards.

One important innovation was the emphasis on discussion groups in addition to the formal speeches. Questions were asked from the floor after each session. In addition, informal discussion groups met to consider individual problems:—The use of material standards by the purchasing agent (*Leader* — H. A. Gillan, Purchasing Department, Eastman Kodak Company); Nuts and bolts, B18 (*Leader* — H. W. Robb, General Electric Company); Decimal scales (*Leader* — Charles M. Wright, Chrysler Corporation).

At the business session, Ralph McKay of the Shell Chemical Company was elected to serve the unexpired term of K. W. Mahen of American Cyanamid on the Administrative Committee of CMC.

Following are excerpts highlighting the speeches presented during the two-day meeting.

Host to Company Member Conference

Mechanics of Company Standardization

S. H. Watson
RCA Victor Division, Radio Corporation of America, Camden, New Jersey

Printed standards are mediums of communication. The term "Communications Quotient" might be used in measuring effectiveness of standards in industrial communications. Factors important for a high "Communications Quotient" are: (1) Logical arrangement of material, tailored to the user; (2) Generous use of illustrations; (3) Simple numbering system; (4) Prominent listing of superseded documents; (5) Distribution system that covers thoroughly all parties at interest; (6) Adequate and convenient facilities at each distribution point; (7) Check list system to check status of standards easily; (8) Vigorous obsolescence program, maximum age limit for all standards, and prompt revisions.

F. O. Smeltz
Allis-Chalmers Manufacturing Company, Milwaukee

This company has a standards department for each of its two divisions —Tractor Division and General Machine Division. Each division is independent of the other but endeavors to maintain uniform standards for drawing and drafting practice and similar subjects that affect the entire company. Because of pressure of committee work on company executives, Allis-Chalmers recently established a standards department with a paid staff. Their work is divided into (a) standards; (b) specifications; and (c) data. This is still on a trial basis.

Charles J. Lawson
International Business Machines Company, New York

Although IBM maintains a Design Standardization Department, Standards Engineering Department, and a Manufacturing Standards Group, all having different duties, close cooperation is maintained between these groups and between other departments of the company, and even between different plants. The Standards Engineering Department as the central standardizing unit, keeps the other sections of the company informed of the latest developments of interest to those particular sections.

Knowledge and Use of American Standards

Perry L. Houser
International Harvester Company, Chicago, Illinois

The first step in standards work is to find out about the existence of an American Standard or of its revision. A very practical method of keeping in touch with standards people is by participation in American Standards committee work. This activity also permits association with standards people from other industrial organizations, exchange of ideas and viewpoints, and results in personal satisfaction and pride from having had a part in development of a nationally recognized standard.

In our company, a contact man in each plant receives, handles, and distributes all standards material in that plant. To promote the use of standards, the company frequently sends out an "Information Letter" to a company-wide mailing list giving the essential details of a new or revised standard.

Can You Hang A Dollar Sign on Standards?

W. H. Kiler
E. I. du Pont de Nemours and Co, Wilmington, Delaware

We use standards because they pay off. On one new product, capital investment was reduced 12 percent; and the new product was on the market six weeks earlier because of standards. Saving in engineering manpower is equivalent to some 10 percent of the design force. Standards permit one man to do the work of many.

Since the inception of our present standards activity, for every dollar spent to develop standards we have saved over six dollars net.

Can you hang a dollar sign? (Continued)

Forest H. Bump
Norton Company, Worcester, Mass.

By eliminating "specials" and using standard commercial items, the Company has made large savings.

In 1947 Norton developed a standard spring chart which resulted in a savings of $1,466 in 1948 and an estimated saving of $6,000 per year since that time. By standardization of ball bearings, we save about $3,700 a year. Improved design often results from standardization gains.

A. W. Anderson
Bausch and Lomb Optical Company, Rochester, N. Y.

We have been able to reduce the number of cylindrical ring gages by 66 percent which represents a saving of $4,000 per year. Simplification of screw threads eliminated all but 17 percent of the former 1,200 thread diameters and pitches for new products. Limiting the sizes and colors of organic finishes saved over $3,000 per year. By application of quality control methods we are now able to determine quickly the acceptability of about 70 percent of optical glass and have cut costs of inspection and storage.

Decimal Scales

Charles M. Wright
Chrysler Corporation, Detroit, Michigan

The Corporation decided that all new designs would be based on decimal dimensioning beginning January 1, 1954. However, this caused trouble because decimal dimensioning scales are not carried as standard by scale manufacturers. Following a meeting of scale manufacturers and automobile manufacturing companies, arrangements are being made to request ASA for an American Standard for decimal dimension scales for mechanical drafting and shop use. All interested should write ASA in order to be kept advised of developments on this subject.

New Materials and Testing Board

All Existing Standards submitted by the American Society for Testing Materials to the American Standards Association for approval are to be handled by a new Materials and Testing Standards Board. The Board, set up by the ASA Standards Council, will relieve the Miscellaneous Standards Board of responsibility for these ASTM Existing Standards.

The new Board is made up of the members of the Administrative Committee on Standards of ASTM and two members named by the chairman of the Standards Council. Members are:

A. E. Pringle, II, Vice-President, Pringle Electrical Manufacturing Company; chairman, ASA Committee on Procedure and Administrative Problems, *Chairman*

J. H. Foote, President, Commonwealth Associates, Inc, Jackson, Mich; chairman of the ASTM Administrative Committee on Standards

G. H. Harnden, Specifications Engineer, General Electric Company, Standards Services Department, Schenectady, N. Y.

L. J. Jacobi, Inspection and Standards Engineer, Detroit Edison Company, Detroit, Mich.

L. W. Kattelle, Chief Engineer, Walworth Company, New York, N. Y.; Vice-Chairman, ASA Mechanical Standards Board

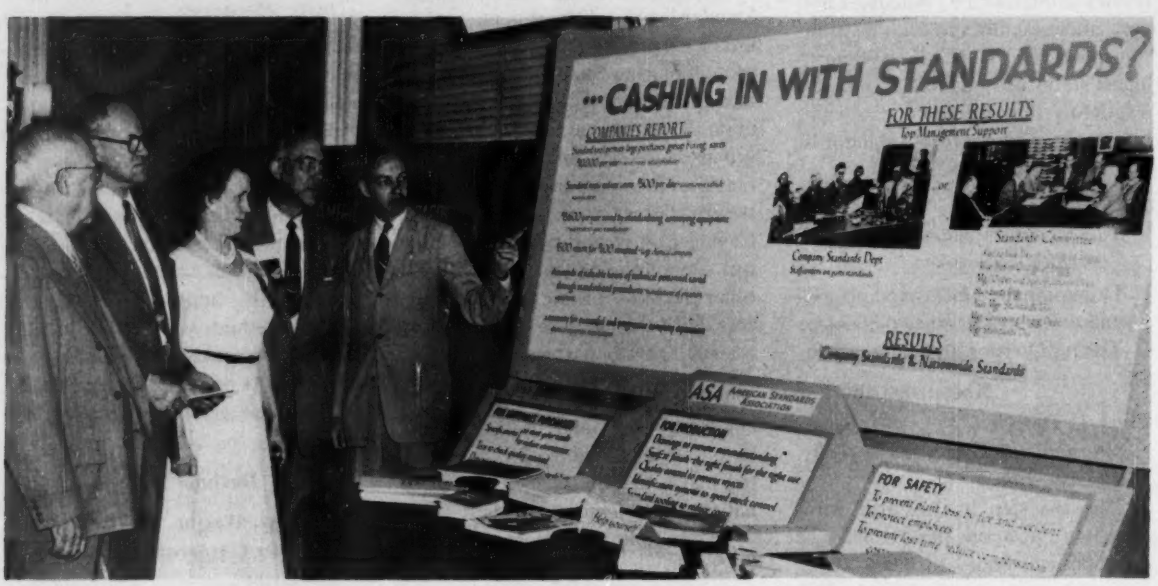
A. E. Miller, Assistant to Vice-President and Process Chemist, Sinclair Refining Company, New York, N. Y.

D. E. Parsons, Chief, Building Technology Division, National Bureau of Standards, Washington, D. C.

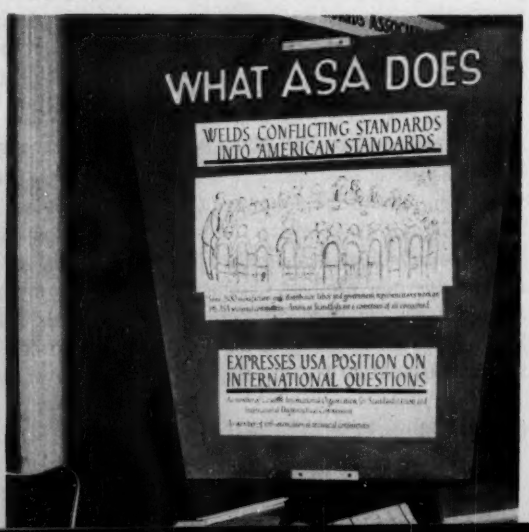
W. A. Zinzow, Assistant Director of Development, Bakelite Company, a Division of Union Carbide & Carbon Corporation, Bound Brook, N. J.

F. G. Frost, American Standards Association, *Secretary*

In announcing appointment of Mr Pringle and Mr Kattelle at the May 28 meeting of Standards Council, J. R. Townsend, the Council's chairman, said: "Mr Pringle represents the National Electrical Manufacturers Association on the Standards Council, has been a member of the Committee on Procedure for several years, and is its present chairman. Mr Kattelle represents the Manufacturers Standardization Society of the Valve and Fittings Industry on the Standards Council, has been a member of the Mechanical Standards Board for a number of years, and its vice-chairman since 1950, and has also served on the Board of Review. These men have undertaken these assignments at considerable personal sacrifice. I am personally grateful to them, and I am sure that the Council is also, for the assistance they are giving in launching this new activity."



More than 500 top executives *of American industry saw ASA's exhibit at the General Management Conference, sponsored by the American Management Association, Hotel Statler, New York, June 21-23. Above (left to right) R. M. Gates, president, Air Preheater Corporation, member of ASA's Board of Directors; Vice Admiral G. F. Hussey, Jr., (USN, ret) managing director, ASA; Miss Lyda Sjoholm, ASA staff, in charge of exhibit; Lawrence A. Appley, president, American Management Association; George P. Paine, ASA director of public relations.*


WHAT ASA DOES
WELDS CONFLICTING STANDARDS INTO 'AMERICAN' STANDARDS
EXPRESSES USA POSITION ON INTERNATIONAL QUESTIONS

by S. P. Kaidanovsky

How the City of Chicago Modernized Its Purchasing Through Standards

John F. Ward
Purchasing Agent, City of Chicago

Centralized Purchasing

Advantages of Centralized Purchasing:—The advantages made possible by centralized purchasing are manifold:

(a) Consolidation of requirements which permits buying in large volumes, with resultant savings accruing therefrom;

(b) The standardization of specifications;

(c) Better inspection of deliveries and establishment of a central testing and inspection unit;

(d) Creation of central warehouses;

(e) The lowering of overhead cost by reduction of paper work and the resultant savings in personnel effort;

(f) The development of competition and better sources of supply;

(g) The adoption of a uniform policy of procurement, which is not always possible under other systems.

Centralized purchasing results in standard types of documents, specifications, contracts, and performance bonds. It permits the uniform treatment of bidders, vendors, and contractors in their various relations with the purchasing department.

Development of Centralized Purchasing in the City of Chicago: — As early as December 1931, the City of Chicago looked forward to streamlining its purchasing system.

An advisory committee was created to make a study of the City's procurement problems. The report of the advisory committee proposed to centralize all the purchasing under one department, with the exception of the Public Works contracts. This report was approved by the Mayor and City Council, and a Bureau of Central Purchases was organized.

In 1941, after a study made by professional purchasing technicians at the request of the Mayor, a report was issued recommending improvements and adoption of the latest centralized purchasing techniques.

Chicago, like most large cities, does not have home rule, so it must obtain legislation from the state. It was not until the Illinois State Legislature met in 1947 that a bill was passed setting up a bona fide central purchasing system for the City of Chicago. The bill was signed by the Governor in July 1947 and became effective January 1, 1948.

Under the new Act, which according to its title, applies to cities with more than 500,000 population, Chicago is the only city in the State which is affected. On July 20, 1949, the Act was amended.

Legal Authority for Standardization

Board of Standardization: — The authority and responsibility for standardization is vested in the Board of Standardization as set forth in Article 22A, Section 22A-17 of the Laws of Illinois, "Municipal Purchasing Act for Cities over 500,000 Population, approved July 20, 1949 (Illinois Revised Statutes, page 448). This Article reads as follows: —

"In all municipalities to which the provisions of this Article shall apply there shall be a board of standardization, which board shall be composed of the purchasing agent for such municipality, who shall be chairman, and six other members who shall be appointed by the mayor of such municipality. Three of the members shall be responsible heads of a major office, department, institution, commission, or board of such municipality and shall receive no compensation for their services on the board of standardization. The other three members may be officers or employees of the municipality but only those such members who are not officers or employees shall be entitled to receive such compensation as the corporate authorities may provide. Any member, excepting said purchasing agent, may deputize a proxy to act in his stead. The board of standardization shall meet at least once each two calendar months upon notification by the chairman at least five days in advance of the date announced for such meeting. Official action of such board shall require the vote of a majority of all members of said board. The chairman shall cause to be prepared a report faithfully describing the proceedings of each meeting, which report shall be transmitted to each member and shall be made available to the mayor and to the corporate authorities, respectively, of such municipality within five days, excluding Sundays and legal holidays, subsequent to the date of the meeting.

"It shall be the duty of the said board of standardization: (a) to clas-

Mr Kaidanovsky is Technical Director of the Management and Technical Services, New York. He was formerly chairman, Federal Interdepartmental Standards Council; technical consultant, Federal Specifications Board; and editor Standards World.

sify the requirements of such municipality, including the departments, offices, institutions, commissions and boards thereof, with respect to supplies, materials, and equipment, of common usage, (b) to adopt as standards, the smallest numbers of the various qualities, sizes and varieties of such supplies, materials and equipment as may be consistent with the efficient operation of such municipal government, and (c) to prepare, adopt, promulgate, and from time to time revise, written specifications describing such standards.

"Specifications describing in detail the physical, chemical and other characteristics of supplies, material or equipment to be acquired by purchase order or contract shall be prepared by the board of standardization: Provided, that all specifications pertaining to the construction, alteration, rehabilitation or repair of any real property of such municipality shall be prepared by the engineering agency engaged in the design of such construction, alteration, rehabilitation or repair, prior to approval by said purchasing agent, and any such specification shall form a part of any such purchase order or contract; and, provided further, that the performance of all such contracts shall be supervised by the engineering agency designated in such contracts.

"In the preparation or revision of standard specifications the board of standardization shall solicit the advice, assistance and cooperation of the several requisitioning agencies and shall be empowered to consult such public or non-public laboratory or technical services as may be deemed expedient. After adoption, each standard specification shall, until rescinded, apply alike in terms and effect to every purchase or contract for the purchase of any commodity, material, supply or equipment and shall be made available to the public upon request."

Purchasing Agent: — The authority and responsibility for standardization vested in the Purchasing Agent is set forth in Article 22A, Section 22A-15, as follows:

"The purchasing agent shall . . . (f) enforce written specifications describing standards established in conformity with this Article, (g) operate or require such physical, chemical or other tests as may be necessary to insure conformity of such specifications with respect to quality of materials . . ."

The unique provisions of the Municipal Purchasing Act, not only on standardization, but on purchasing policies, authority, and responsibility of the purchasing agent, bidding procedures, and awarding and assignment of contracts, seem to be the answer to problems facing the municipalities of other states. It is hoped that the pioneering work of the Legislature of the State of Illinois and the administrative experience of the Department of Purchases, Contracts, and Supplies of the City of Chicago will serve as a model in the development of purchasing laws in other municipalities.

Organization of the Department of Purchases, Contracts and Supplies

The Department of Purchases, Contracts, and Supplies, under the direction of John F. Ward, Purchasing Agent, consist of seven divisions: Administrative, Purchasing, Market Research, Contract, Expediting and Control, Testing and Inspection, Warehouse and Stores, and the Board of Standardization.

The Taber-Abraser *is used in making a we*

The technical staff of the Contract Division is concerned primarily with engineering problems in connection with the development and preparation of standard specifications.

The testing and inspection facilities are contained in the Purchasing Department for reasons of good economy, simplicity of operations, and continuity and speed in performing quality control.

Membership of the Board of Standardization

The Board of Standardization is now composed of seven members.

Three members are from industry: —

Frederick J. Heaslip, Vice-President and Purchasing Agent, Fairbanks, Morse and Company

John Morrow, Jr, Vice-President and Purchasing Agent, International Harvester Company

W. W. Kelly, General Purchasing Agent, Atchison, Topeka and Sante Fe Railroad

Three members are from government, representing top departments:

Virgil E. Gunlock, Commissioner of Public Works

Lloyd M. Johnson, Commissioner of Streets and Sanitation

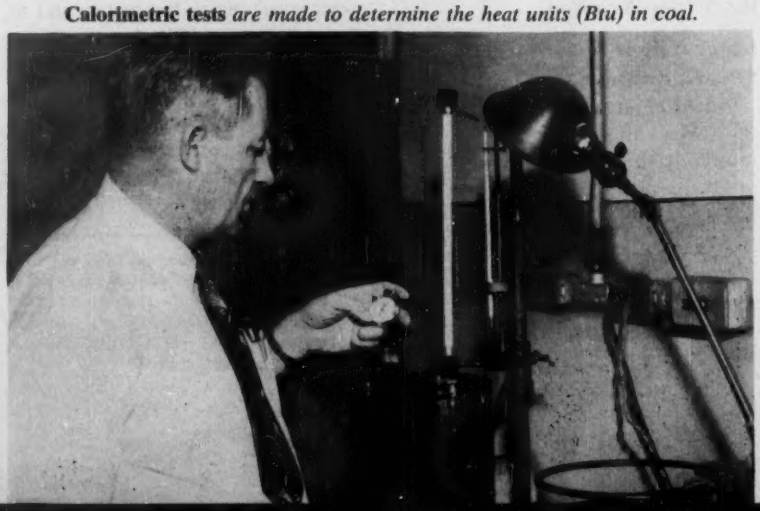
James W. Jardine, Commissioner of Sewers and Water

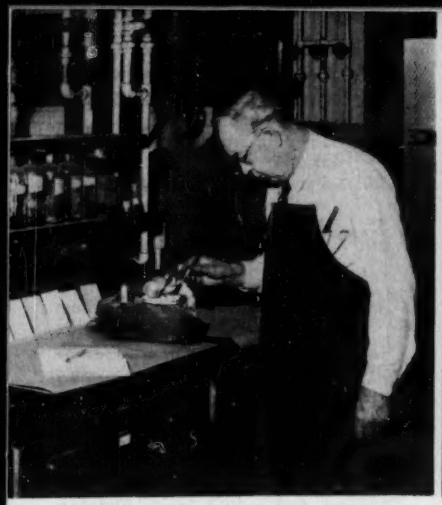
Chairman of the Board, John F. Ward, Purchasing Agent

Procedure for Development of Standard Specifications

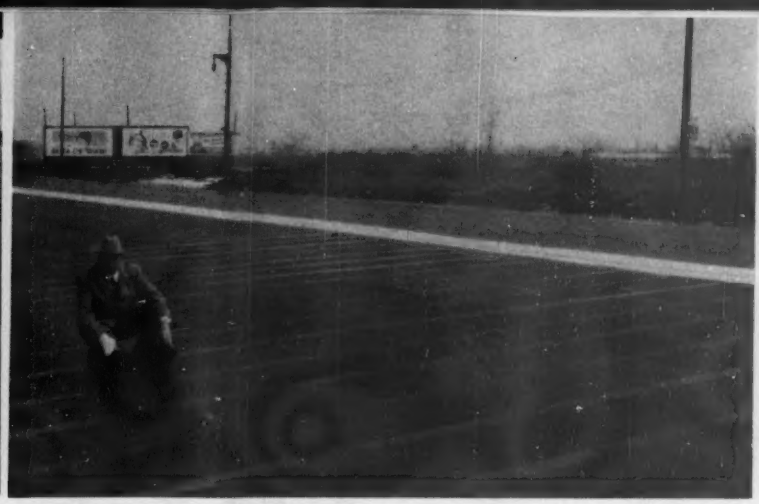
Policy on Type of Specifications:— In developing standard specifica-

Calorimetric tests *are made to determine the heat units (Btu) in coal.*





est on samples of paints for street marking.



Measuring the light *reflected from new street-marking lacquers.*

tions the City of Chicago ascertains that they are truly competitive. It avoids the so called "closed specifications" or "must have this brand" of specifications which eliminate competition to a degree, if not entirely. In many instances such type of specifications can be traced to a personal preference by a using agency.

Wherever possible, the phrase "or equal" has been eliminated in specifications and in lieu thereof definite descriptions of products and definition of ranges of permissible quality are used.

Alternate materials and equipment, performing equally as well as those requisitioned by using agencies, are often specified.

In cases where a wide range of products may serve the needs of using agencies, performance specifications are employed wherever possible. The practice of buying from samples has been entirely discontinued.

Advisory Committees: — The research work in the preparation of tentative specifications is done by 39 Advisory Committees, each having a chairman. The membership of these committees consist of employees, technicians, chemists, and engineers from the using departments and agencies. The Purchasing Agent's technical laboratory and engineering and technical staffs are members of all Advisory Committees. The number of committees is based on the 39 commodity classes used by the City of Chicago as shown on page 220. All City departments using materials and supplies are represented on these committees. Where a department is not represented, it may have waived the invitation to send a representative, predicated on the fact that another department which uses the same materials has a more qualified technician to act as its representative; the findings of such persons are acceptable to said department.

The source or originating point of new standards falls into three categories: —

1. Those suggested by members of the Standardization Board
2. Those suggested by the Advisory Committees
3. Those suggested by the using departments and the Purchasing Agent.

In the preparation of the specifications, the Advisory Committees not only consult with the technicians of the Testing Laboratory, but also call in representatives of the industries concerned and analyze the specifications adopted by technical and professional organizations, as well as Federal Specifications and specifications used by other cities known to have devoted similar efforts in arriving at such specifications.

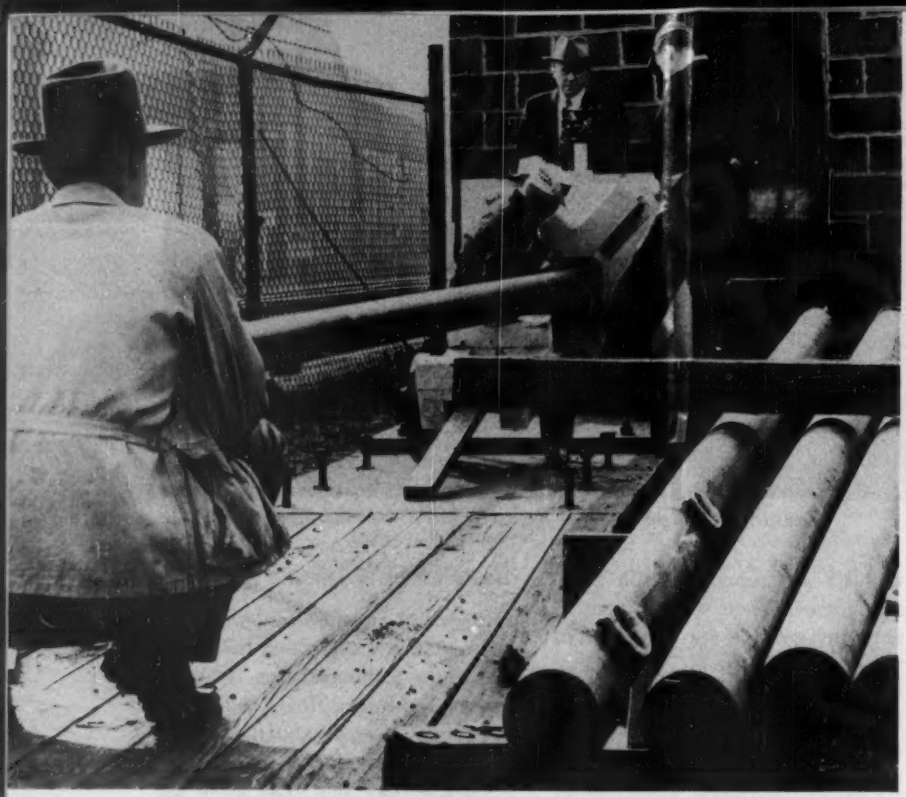
The Deputy Purchasing Agent, designated by the chairman of the Standardization Board, serves as Secretary of the Board. He correlates the work of all Advisory Committees, discusses, suggests, and in effect, assists the Advisory Committee Chairman in the preparation of the tentative specification in its final form for submittal to the Standardization Board for its review and comments.

Board of Standardization:—After the tentative specification is submitted to the Standardization Board, it is analyzed by the Board sufficiently far enough in advance of the mandatory bi-monthly date of hearings.

Where questions arise as to the soundness of the specification, it has been found that the three industry members of the Board quite often consult with their own engineering staff to determine if the proposed specification should be accepted.

Many specifications are not adopted by the Board on first presentation. In many instances, engineering representatives from industry are requested to appear before the Board and submit their comments and suggestions. Many times, after such hearings, the Board orders modifications in specifications.

The policy of the Board has been that, after adoption of a specification, it has become mandatory and all purchases for the City of Chicago have had to be made on such standard specifications. However, the Board has recently adopted a new policy in approving specifications on a tentative basis for a six-month tryout. During this time if industry objects to the requirements of such tentative specifications, it may in writing present its complaints to the Board. The Board then sets a date of hearing and review for any specification unacceptable to industry. It may or may not make changes in existing specifications. However, if after six months,



Street light poles *are tested for deflection and permanent set; inspector supervises.*

no objections are raised to the tentative specification, this specification becomes a standard specification.

The City of Chicago has adopted to date approximately 450 standard specifications.

Use of Nationally Recognized Standards and Specifications: — Use is made of Federal Specifications, ASA and ASTM Standards, U.S. Pharmacopeia, American Hospital Association Specifications, and specifications of technical and professional organizations.

Use of Brand Lists: — The City of Chicago avoids brand names.

Commodity Classification

There are at present 39 commodity classes numbered and designated as follows: —

Class No.	Commodity Classification
1.	Books, Publications and Subscriptions
2.	Castings and Forgings
3.	Cleaning and Janitorial Equipment and Supplies
4.	Clothing and Wearing Apparel
5.	Construction and Repair Materials, Building Materials and Supplies
6.	Drafting and Engineering Supplies, Instruments of Precision and Parts
7.	Drugs, Acids, Chemicals and Gases
8.	Dry Goods, Textiles, Notions, Household Furnishings and Toilet Articles
9.	Electrical Apparatus, Accessories and Supplies
10.	Foods: Groceries, Meats and Poultry
11.	Fuel: Coal, Coke, Gasoline, Wood, Charcoal and Fuel Oil
12.	Furniture: Household and Office
13.	Hardware: General
14.	Hardware: Bolts, Nuts, Rivets, Nails, Screws, Washers, etc.
15.	Hose, Hose Fittings, Gaskets, Packing, Belting, Leather and Rubber Goods
16.	Hospital: Laboratory and Surgical Apparatus and Supplies
17.	Lumber
18.	Fire Fighting Equipment
19.	Machinery: Heavy Equipment, Pumps, Engines, Parts and Supplies (Other than Automotive)
20.	Metals: Bars, Plates, Sheets and Shapes
21.	Miscellaneous
22.	Motor Vehicles, Motor Vehicle Parts and Supplies
23.	Office Equipment, Supplies and Stationery
24.	Brooms and Brushes
25.	Oils, Greases and Lubricants
26.	Paint and Paint Ingredients and Supplies
27.	Pipe Fittings, Nipples, Valves and Accessories
28.	Printing: Books, Cards and Forms
29.	Radio and Sound Signal Apparatus
30.	Tools: Hand and Welding Supplies
31.	Wire, Cable and Chain
32.	Cordage: Hemp, Jute, Manila, Oakum and Cotton
33.	Lighting Apparatus (Non-Electric)
34.	Playground Apparatus and Recreational Equipment: Badges
35.	Meters and Repair Parts
36.	Boats and Marine Supplies
37.	Poles, Pedestals and Attachments
38.	Plumbing Fixtures, Bathroom and Toilet Fixtures, Accessories and Parts
39.	Pipe and Tubing

Commodity Catalog

The first edition of the Commodity Catalog, entitled "Commodity Classification Index and Stock Catalog, has been issued in 1954. It took four years to prepare this edition. The Catalog covers approximately 160,000 items, of which 20,000 are common use items.

A Commodity Classification Finding Index shows the various commodities in alphabetical order and the class number assigned to each commodity. Each class in the main body of the catalog is in numerical sequence, 1 to 39, also 70 (service); and items within each class are listed in alphabetical order.

As items are approved by the Standardization Board and become standards, they are identified by an asterisk after the code number.

Structure of the Commodity Code: — The commodity code is composed of seven digits: The first two digits represent the commodity class, the next two digits — expansion numbers within the class; and the last three digits designate the specific item. For example, the commodity code number for Electron Tubes is 2985 410, where 29 is the class number for Radio and Sound Signal Apparatus, 85-expansion number within the class, and 410-number for electron tubes.

The standard specification for Electron Tubes is designated by the same code number — 2985 410, this tie facilitates to a great degree supply operations.

Testing and Inspection: — Efficient control of quality has been developed through the Testing and Inspection Division. Testing and inspection is considered one of the most important functions of the Depart-

ment of Purchases. Approximately 17 percent of the 1954 budget of the Department was appropriated for this purpose. This Division is augmented by testing contracts with two commercial laboratories.

The activities of the Division fall into several categories.

(1) Continuous routine inspection and testing of materials which enter into a finished job, such as a building, a bridge, or a street. Since most of the items going into construction of this nature are common use items, such as sand, gravel, asphalt, steel, brick, lumber and other materials, they are covered by standard specifications. Inspection and testing of such materials is done before such materials change form in the actual construction by the builder. Whenever such materials do not meet standard specifications, the contractor is notified that the materials are not acceptable and must be replaced. The Testing and Inspection Division has no control over the analysis of any material once it goes into the construction job. The responsibility for engineering inspection of a building, bridge, or street lies with the using department, whose responsibility is to ascertain that the engineering design and construction conform to engineering specifications prepared by the using departments.

(2) Periodic or 100 percent tests required on items affecting public health and safety.

(3) Random tests selected from contractor lists or commodity lists to maintain a general policing action.

(4) Tests of samples submitted with bids to determine compliance with advertised specifications and incidental to the award of contract.

(5) Assistance on inspection of work or construction contracts outside of the regular scope of the Division, where such tests can be performed to the City's advantage.

(6) Direction and interpretation of tests performed by outside testing laboratories and where the City is not equipped for such tests or does not have sufficient capacities available.

(7) Research work to determine suitability of various materials for the purposes intended.

(8) Technical assistance in the development of commodity specifications for using departments and agencies, the Contract and Purchasing Division of the Department of Purchases, Contracts and Supplies, and the Standardization Board.

The physical activities of the Testing and Inspection Division are carried on in its testing laboratory, in tests in the field, at manufacturers' plants or where the products are fabricated. The testing laboratory of the City of Chicago is provided with up-to-date testing equipment, and is considered one of the best municipal testing laboratories in the USA.

Basis of the Chicago Supply Management System

The Chicago procurement system is rather unique in that it has adopted many of the key principles of good administration from industry, as well as key function points from municipal governments throughout the country, and has combined them into an efficient supply operation.

Standardization — An Investment

Benefits from Standardization: — Standardization of common use items and adoption of standard specifications is perhaps one of the most important of the "purchasing tools." Many benefits from standardization resulted to using departments and agencies of the City of Chicago:

1. Better materials and more efficient equipment obtained.
2. Unnecessary requirements eliminated.
3. Replacement repairs decreased.
4. Quality rating established.
5. Expense of preparing specifications reduced.
6. Obsolescence of items controlled.
7. Uniform stocks established in various using departments.
8. The number of sources of supply increased.
9. The number of types, sizes, colors, and other characteristics reduced.
10. Bulk buying of commodities increased.
11. The requisitioning of preferred items by using departments reduced.
12. Uniform quality of products established, thus encouraging industry to tool up and manufacture such products.

Savings through Standards: — Standard specifications have contributed to reducing inventory from nine million to four and one-half million dollars. The City of Chicago in 1953 spent about 52 million dollars. All purchases were covered by specifications, however, no records are available now to determine how much of these purchases were covered by standard specifications.

In an analysis made in 1950 at the request of the Standardization Board, the percentage of savings by the use of standard specifications amounted to 9.3 percent.

SPAGNA WILL STREAMLINE NEW YORK'S PURCHASING

Following a conference with Luther H. Gulick, City Administrator, steps are being taken by Joseph V. Spagna, Commissioner of the Department of Purchase, to streamline the Purchasing Department of the City of New York in order to achieve savings in buying.

One of the immediate projects to be considered is the review of existing standards and specifications, the elimination of unnecessary grades, kinds and types of commodities and the consolidation of purchases for different agencies in the city administration. An effort will be made to use existing Federal and other applicable specifications in order to bring City specifications up-to-date with latest technological developments.

In order to achieve uniformity of commodities stored in all City warehouses, an up-to-date commodity classification system will be encompassed and installed suitable for the City's requirements. The inspection and testing of materials and products are being studied in order to consolidate some of the activities and improve their operations.

Commissioner Spagna believes that this new approach to the problems of supply management will not only improve the operations of the Department of Purchase but will result in better quality of products, resulting in savings to the entire city.

The present activities of the New York City Department of Purchase and the outline of the future program will be described by Samuel P. Kaidanovsky in the September issue of THE MAGAZINE OF STANDARDS *in the section on "Government Standards."*

How to Translate Science Into Practice

From the report of J. R. Townsend, Chairman, ASA Standards Council, May 28, 1954

SEVERAL times in the past I have emphasized my belief that national standardization is the avenue for communicating to industry the vast amount of scientific and technical knowledge that has been built up during the past several years. The developments of the war and the national activities necessitated by world events have placed science years ahead of industry. This scientific knowledge needs to be translated into practical procedures for use by industry, and standardization is the best avenue for the translating process.

At the meeting of Standards Council held about a year ago, we listened to a discussion outlining the importance of standardization in the scientific use of materials in connection with national defense and normal economic development. These discussions were presented by Dr Verne Schnee, Executive Director, and Dr W. J. Harris, Jr, Executive Secretary, of the Mineral and Metals Advisory Board, National Academy of Sciences. Since that time the necessity for reorganizing the materials program has been indicated and a new Materials Advisory Board, under the National Academy of Sciences, has been created.

It is planned that the Materials Advisory Board will address itself to broad problems of engineering materials — metals and nonmetals. As far as possible the Board will work on projects of broad scope and avoid as much as possible materials problems which are well within the range and capability of the military services' laboratories. For instance, the Board will look into the possibility of an alloy as a competitor material for high-temperature and low-weight applications, which at present favor the use of titanium. A study of the physical properties of sintered aluminum oxide for some of these applications is also a possibility. The Board will have a look at the selenium rectifier program and is planning to consider in its broader aspects the rubber program. These few studies will indicate that the Board will have all materials within its purview, and in my opinion the Board will be a powerful influence in dealing with standards. The Board's connection with the American Society for Testing Materials and the American Standards Association should help coordination of the work with Government agencies and personnel.

The personnel of the Board includes 25 of the top materials men of the country, and its work will become of very great importance to national defense and future industrial developments. It is for these reasons that such great stress has been placed on building new but sound procedural operations for processing standards developed by ASTM and brought to ASA for approval as American Standard.[1] The new Standards Board of ASA, recently authorized by the Standards Council, should prove to be very valuable to this end.

Mr Townsend is Director of Materials and Standards Engineering, Sandia Corporation, Albuqerque, New Mexico, and is chairman of the Materials Advisory Board of the National Academy of Sciences. He is also chairman of ASA's Standards Council.

Government Relations

The most recent meeting of ASA's Board of Directors was held in Washington, D. C. The primary purpose of the meeting was to provide an opportunity for members of the Board to meet a number of government officials whose duties in one way or another include standardization and with whom ASA Government relations might be discussed. In my opinion nothing is more important at this time than the building of the most complete cooperative government relations. The events of the past few years, starting with the withdrawal of government departments from membership in ASA, have been very distressing. The government has a place and a stake in the national standardization program. It must be encouraged to see that a national standards body such as ASA, functioning as a clearinghouse for standards, is essential from a governmental as well as an industrial viewpoint. For 30 years the government assisted in the development and operation of the clearinghouse and that relationship should be re-established as soon

Materials Advisory Board, National Academy of Sciences

Chairman, John R. Townsend, Director, Materials and Standards Engineering, Sandia Corporation

Vice-Chairman, Dr Francis C. Frary, Technical Advisor, Aluminum Company of America

Members

Dr E. C. Bain, Vice-President, U.S. Steel Company
Dr E. K. Bolton, Chemical Director (Retired), E. I. du Pont de Nemours and Company, Inc
Dr S. M. Caldwell, Director, Research and Development, U.S. Rubber Company
Dr John Chipman, Head, Department of Metallurgy, Massachusetts Institute of Technology
Dr James H. Critchett, Vice-President (Retired), Union Carbide and Carbon Research Laboratories
Alvin J. Herzig, President, Climax Molybdenum Company of Michigan
Dr Matthew A. Hunter, Dean of Faculty Emeritus, Rensselaer Polytechnic Institute
Dr Zay Jeffries, Vice-President (Retired), General Electric Company
Walter E. Jominy, Chief Research Metallurgist, Chrysler Corporation
Dr C. K. Leith, Emeritus Professor of Economic Geology, University of Wisconsin
Dr D. H. McLaughlin, President, Homestake Mining Company
Dr Lorrain J. Marquardt, Forest Products Laboratory
Dr C. S. Marvel, Professor of Organic Chemistry, University of Illinois
Dr Robert F. Mehl, Dean of Graduate School, Carnegie Institute of Technology
Dr H. J. Osterhof, Director of Research, Goodyear Tire & Rubber Company
Dr Albert J. Phillips, Director of Research, American Smelting & Refining Company
Oliver C. Ralston, Chief Metallurgist, U.S. Bureau of Mines, Department of the Interior
Dr Cyril S. Smith, Director, Institute for Study of Metals, University of Chicago
E. C. Smith, Chief Metallurgist, Republic Steel Corporation
Dr John G. Thompson, Chief Metallurgist, National Bureau of Standards
Dr Hans Thurnauer, Director of Research, American Lava Corporation
Professor Walter C. Voss, Professor of Building Construction, Massachusetts Institute of Technology
Dr Clyde Williams, Director, Battelle Memorial Institute

Executive Secretary

Robert Burns, Bell Telephone Laboratories

as possible. Several government agencies now operate under directives which require that the standards of these agencies be based on nationally recognized standards and that departures from such standards be made only when special circumstances require. These directives, of course, refer to all standards of national significance, not just those approved as American Standard. All of this means that the extent of use of American Standards by government agencies is proportional to the degree of participation in the development and approval of the standards. It is hoped, therefore, that the very friendly discussion between ASA's Board of Directors and the Government officials will serve to increase governmental participation in ASA operations.

In this connection it is gratifying to have representatives of the National Bureau of Standards and the General Services Administration so frequently in attendance at the meetings of Standards Council. This evidence of understanding and cooperation is greatly appreciated.

All these matters clearly indicate that ASA is facing many new developments in operating as the focal point of national standardization in this country. It must be ready and willing to make the necessary adjustments in methods and policies to meet the future needs. This does not mean that ASA must in any way sacrifice the fundamental principles around which it has been built. They have been challenged many times in the past 35 years but they have stood each test and have been consistently maintained. In most cases those who came to challenge became the most ardent supporters. The basic principles can be maintained while changing the methods of applying them. This has been done over and over again in ASA and ASA has become stronger and stronger and more acceptable in the eyes of those affected.

[1] A new Materials and Testing Standards Board has been set up by the ASA Standards Council to process all existing Standards submitted by the American Society for Testing Materials for approval by ASA and formerly handled by the Miscellaneous Standards Board (see page 216).

ASA—Synonymous With Progress

by J. R. TOWNSEND

THIRTY-FIVE years ago, the American Standards Association, then known as the American Engineering Standards Committee, started its campaign to build a national standardization program. Prior standardizaiton work, of very extensive degree, had been confined to company activities and programs of technical societies, trade associations, and governmental agencies. World War I proved that these activities needed coordination; as a result, five engineering societies were joined by three federal governmental departments in the development and operation of new machinery which would provide that coordination.

The founders of ASA very wisely decided not to form a new standards-creating organization. To do so would have increased the confusion. The new organization was created essentially to formulate a procedure whereby standards already existing, or those which might be developed in the future, could be judged not on their technical merits necessarily but on the degree of acceptance which they had been given by the various organizations concerned with their contents.

The procedure first established called for the formation of a committee ("a sectional committee"), representing the groups concerned. This committee would review all the technical material contained in the standards to be coordinated and from them build a new standard. On the basis of its national acceptance this new standard would take the place of the several previously existing standards. Also on the basis of this national acceptance, these standards would receive the designation "American Standard." While new, this procedure was progressive, effective, and made history in the building of the first truly national standards. ASA (then AESC) became the symbol of national progress in standardization.

Those who participated in this new program, as members of ASA, as individuals, or as organizations that had created standards, and who thereby understood the philosophy back of the procedure, thoroughly appreciated its value. But, typical of the experience of pioneering efforts, there were those who did not understand and who therefore criticized the program as being destructive of individual effort. Fortunately, however, there were individuals and organizations who saw in this criticism opportunity for progress. New procedures were built embodying the fundamental principles, that of establishing national acceptance, but permitting direct review, by the groups concerned, of standards developed by any national organization.

The new procedure, the present "Existing Standards Method" of approving standards, enabled national organizations to bring their standards to ASA and, by showing evidence of extensive use and broad acceptance by all those concerned, to obtain for their standards the designation "American Standard." This was a recognition of the great service rendered by many national organizations in building standards of value not only to the members of the organization but to technical and management personnel throughout the country. It was recognition by ASA that it was not necessary in the coordination process to create committees in all cases to rebuild what had already been established. In many cases, direct review of established standards, and acceptance thereby, could establish the existence of a consensus and thus justify the application of the designation "American Standard." ASA became increasingly effective as a symbol of progress.

The American Society for Testing Materials, one of the organizations that created ASA, took the lead in developing the Existing Standards Method. It proved its belief in the value and effectiveness of ASA operations as a whole, as well as its faith in the new procedure, by bringing to

ASA many methods of test and specifications of materials to receive the designation "American Standard." To date, more than 500 such ASTM standards have received the broad national designation provided by ASA to indicate the national consensus which these standards had attained. This leadership by ASTM encouraged other organizations to use the procedure and, as a result, new groups came to understand ASA and its objectives. They in turn became part of the leadership which helped build a consistent set of standards having the designation "American Standard."

Never satisfied with progress at any one time, ASA has frequently reviewed its operations to see if by interpretation, simplification, or revision still further progress could be made in obtaining acceptance of the national program as exemplified by ASA operations and objectives. Such a review was instituted two years ago and culminated in acceptance of recommendations for further simplification of the Existing Standards Procedure by the Standards Council of ASA at its May 28, 1954, meeting.[1]

Recent Action by Standards Council

In the process of developing these recommendations, many national organizations which had not used the procedure to secure the designation "American Standard" for the standards which they had developed through their own operations were questioned concerning their objections to the procedure. They were also asked whether they had objections to the administration of the procedure by ASA and were questioned to determine whether there might be lack of understanding of ASA objectives, as well as on other matters which might have discouraged the use of ASA machinery. Excellent cooperation in this survey was received and the suggestions and the general experience gained were used in building the recommendations reviewed by the Standards Council at its recent meeting.

These new procedures do not fundamentally change the Existing Standards Procedure. Rather, they refine, define, interpret, and simplify the wording so that the relationship of other procedures of ASA is clearly set forth, the administrative policy of the procedure has been clarified, the methods of securing the assent of all parties at interest are outlined, and ambiguities of language have been removed. So far as can be determined at this time, the objections that had been voiced have been met. Furthermore, they have been met without sacrificing in any way any of the fundamental principles on which ASA has been built.

Regardless of the method used for development of a standard or for processing it for consideration as American Standard, ASA cannot guarantee that the standard will receive ASA approval. ASA approval is too significant and far reaching in effect to be given lightly. The judicial processes of ASA must always be sensitive to the weaknesses as well as the strengths of any standard submitted. On the other hand, sponsors of standards need no longer fear that standards processed through ASA under the Existing Standards Method will be thrown to the wolves and torn apart, that the sponsor's relationship to the standard will be destroyed, and that control will be lost. At any point in the approval process, the sponsor can withdraw the standard from further consideration under ASA procedure if it is dissatisfied with ASA operations.

When ASA contacted the various organizations concerning their attitude toward the Existing Standards Procedure, several indicated that some of the standards that they had developed would make excellent candidates for approval as "American Standard." In most cases such standards have not as yet been brought to ASA. It is to be hoped, however, that the recent action of Standards Council will stimulate such submittals. In this way industry, government, and technology will be able to unify its ideas, requirements, and practices. Such integration is absolutely essential if the challenges of the future are to be met. As a federation of 100 and more national organizations, ASA through action by the Standards Council which represents these organizations, has looked forward to and cleared its decks for future action. It can proceed to its objective of building a single consistent set of standards, designated American Standard, only to the extent that its members and other national groups are forward looking enough to avail themselves of the services of the progressive actions just taken.

It is not ASA that profits the most through the approval of standards. Only the normal credit that goes with service rendered accrues to ASA. The organization whose standards receive acceptance of all national groups concerned and which thereby receive the designation "American Standard" becomes an organization of distinction. It is recognized as being progressive and forward looking. Its leadership is accepted. Best of all it has the personal satisfaction of a job well done.

[1] These changes have been sent to letter ballot of the Standards Council for vote on behalf of the Member Bodies of ASA.

Can Pallets Be Standardized ?
(continued from page 207)

are not properly designed for handling palletized cargo, many palletized shipments were successfully made overseas during the war years. Appreciation of existing ship deficiencies has led to reports indicating these deficiencies in detail so that action can be taken to eliminate them in new construction. New equipment is also being tested within ships to expedite handling of palletized loads. The savings involved in palletized handling have recently been the subject of correspondence between the International Organization for Standardization and the American Standards Association, requesting information as to possible international standardization of pallets. Information reveals the suitability of the 40 x 48-in. pallet for use in overseas transportation; therefore, it appears this size will receive particular attention.

The many differing points of view concerning pallets are expected to bring forth excellent discussions during forthcoming meetings on standardization. Through compromise and by paying attention to the major requirements of different groups, it is believed that acceptable pallet standardization can be accomplished.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering please refer to the number following the title.

667 DYEING AND BLEACHING INDUSTRIES

Argentina (IRAM)

Ochre pigment	IRAM 1026

South Africa (SABS)

Standard specifications for kaolin for use in distempera and paints	SABS 442-1953
Standard specification for indelible marking ink for textile fabrics	SABS 432-1953

Sweden (SIS)

Zinc white; testing	SIS 16 00 13
White lead; testing	SIS 16 00 14
Litopon; testing	SIS 16 00 15
Determination of iodine number	SIS 16 00 17
Zinc white, specifications	SIS 16 04 02
White lead, specifications	SIS 16 04 03
Litopon, specification	SIS 16 04 04

669 METALLURGY

Belgium (NBN)

Copper and copper alloys, common quality, for refined rolled and drawn articles	NBN 266

Nationalist China (CNS)

Copper, common	CNS 367-H6
Brass, common	CNS 368-H7
Quality brass	CNS 369-H8
Hard brass cables	CNS 370 H9
Soft brass cables	CNS 371-H10
Round brass rods	CNS 372-H11

Czechoslovakia (CSN)

13 standards for aluminum and aluminum alloy rods, strips, shapes, etc.	CSN 42 1419, -7510, -7520, -7524, -7550, -7560, -7570, -7580, -7585, -7610, -7620, -7624, -7630

France (AFNOR)

Determination of gold and silver content in lead	NFA 06-502

Germany (DNA)

Aluminum, different grades	DIN 1712, B1.1,3
Aluminum alloy seamless tubes	DIN 1795

India (ISI)

Mild steel and high-tensile steel bars and wires for concrete reinforcement	IS 432

Italy (UNI)

Cold rolled brass sheets	UNI 3233
Cold rolled steel strips: quality requirements, tests	UNI 3351/2
Nickel, quality requirements	UNI 3353
Heat treatment of ferrous materials: Nomenclature	UNI 3354
47 standards for different test methods of metals	UNI 3347/9; 3351/3395

Japan (JISC)

Rolled steel plates for boilers	JIS G 3103
Round bars for chains	JIS G 3105
14 standards for different ferrous materials	JIS G 2301*/14*
Classification of iron and steel scrap	JIS G 2401*
Structural steel for general purposes	JIS G 3101*
Carbon steel for machine construction	JIS G 3102*
Rolled steel for welded structures	JIS G 3106*
General rules for iron ores and manganese ores	JIS M 8201
16 standards for different chemical analyses of iron ores	JIS M 8211/26
9 standards for different chemical analyses of manganese ores	JIS M 8231/9
General rules for chemical analysis of ferro alloys	JIS G 1301
14 different methods for chemical analyses of ferro alloys	JIS G 1311/24
Refined aluminum	JIS H 2111
Zinc alloy die castings	JIS H 5301
Standard operation of zinc alloy die casting	JIS H 9131
Copper sheets	JIS H 3101*
Copper bars	JIS H 3401*
Free-cutting brass bars	JIS H 3422*
Round brass wire	JIS H 3521*
Aluminum sheets	JIS H 4101*
Aluminum discs for export	JIS H 4102*

Mexico (DGN)

Nickel-alloy steel bars	B 57

South Africa (SABS)

Standard specifications for aluminum ingots and aluminum alloy ingots	SABS 353/367 -1952
Standard specifications for mild steel and low alloy welding rods	SABS 393-1952
Standard specifications for aluminum alloy castings	SABS 368/384 -1952
Standard specifications for rolled carbon steel structural sections	SABS 221-1953

Sweden (SIS)

Copper, brass and bronze alloys. Rolled, drawn or forged. General survey	MNC 50
Copper, brass and bronze sheets	MNC 150
Copper, brass and bronze strips	MNC 250/1
Copper, brass and bronze shapes, extruded	MNC 350
Copper, brass and bronze shapes drawn from strips	MNC 352
Copper, brass and bronze wires of different cross section	MNC 450
Copper, brass and bronze tubing of different form	MNC 550
Copper, brass and bronze forging	MNC 650
Steel forgings	MNC 720
Copper for electrical purposes	SIS 14 50 10
Copper, grade 50 13	SIS 14 50 13
Phosphor deoxidized copper	SIS 14 50 15
20 standards for brass of different chemical composition	SIS 14 51 12
3 standards for bronze of different chemical composition	SIS 14 54 20

Switzerland (SNV)

10 standards for different sizes, forms and types of pure aluminum and aluminum alloy bars and sections	VSM 11870/5, -11877/80

United Kingdom (BSI)

Nickel anodes and nickel salts for electroplating	BS 558, 564:1953
Electroplated coatings of nickel and chromium	BS 1224:1953
Methods for the analysis of aluminum and aluminum alloys: Copper (absorptiometric method)	BS 1728: Part 5:1953
Rust, acid and heat resisting steel wire for springs	BS 2056:1953
Phosphor bronze spring washers for general engineering purposes	BS 2061:1953
Steel wire for spokes	BS 2453:1954

674 WOOD INDUSTRY

Australia (SAA)

Interim specification for heavy engineering structural timbers from Eastern Australian hardwoods	SAA Int.336, May, 1953
Interim specification for rail track sleepers, crossing or lead timbers and bridge transoms	SAA Int.367, April, 1953

Czechoslovakia (CSN)

Lumber from coniferous species	CSN 49 1110

Denmark (DS)

Saw-cut lathing	DS 366
Standard sizes of lumber	DS 146
5 types of wooden boxes for fish	DS 710/713.2

France (AFNOR)

Classification of certain species of native wood	NF B 53-502
Standard sizes of lumber of different species	NF B 53-001/011

Germany (DNA)

3 standards for different testings of wood	DIN 52350/2

India (ISI)

Classification of commercial timbers and their zonal distribution	IS:399

Norway (NSF)

Parket oak boards — Dimensions and Grading	NS 192 A

South Africa (SABS)

Standard specification for producers' nailed wooden boxes for eggs	SABS 451-1953

Sweden (SIS)

Wooden cases for packing fish	SIS 71 20 01

United Kingdom (BSI)

Panelled and glazed wood doors	BS 459: Part 1:1954
Timber, Dutch light structures	BS 2093:1954

How to Use "ASA" in Photography

by CAROLYN LOCHER

IT IS seldom that a photographer consciously considers the fact that standardization is responsible for giving him greater satisfaction in the use of his camera. Standard dimensions for film, standard parts for cameras, standard processing procedures and the like all contribute to the ease with which he operates his camera, and the pleasure with which he views the finished product. One phase of the standardization program, technical though it is, touches him closely. Every time he buys a package of film, he profits by the reference in the instruction sheets to the "Exposure Index."

American Standard "Exposure Index"

At the first meetings of the committee responsible for the development of the "Exposure Index" it became apparent that there was an urgent need for standards which would provide a means for expressing to the public in a simple and reliable manner the sensitivity of films used for ordinary picture taking. The committee wanted standards that could be used by all, including manufacturers, dealers, publishers of technical magazines, and picture takers of all types from the casual snap-shot artist to the engineer or scientist who uses photographs for technical records.

To the special standards committee assigned this project the task seemed great indeed, for the problem was by no means new and many attempts to solve it had been made over the years in this country and abroad by individuals and organizations concerned. None of these met with universal success and it seemed impossible to produce an entirely satisfactory system for expressing photographic speed, much less a program correlating other elements as well.

The year 1948 saw essentially all of this particular program completed and the necessary standards well established in American photographic practice.

The American Standard Method for Determining Photographic Speed and Exposure Index, Z38.2.1-1947 (currently under revision as PH2.5 to include additional material), describes a means of measuring the sensitivity characteristic of film in terms directly related to picture-taking practice. A new testing method was set up in the standard and many important terms which had come to have a variety of meanings, such as "speed," were carefully defined. The standard also introduced a new concept, termed "Exposure Index," which is a value directly related to the exposure normally required for taking a picture. Exposure Indexes appear to be of greater use to most photographers than sensitometric speeds, which represent a more basic concept. The related American Standard for General-Purpose Photographic Exposure Meters (Photoelectric Type), Z38.2.6-1948, requires that Exposure Indexes be used for the "film settings" on exposure meters.

In 1942 an American Emergency Standard Photographic Exposure Computer, Z38.2.2-1942, was developed under ASA wartime procedure by a group of experts in the field. This standard was a direct result of a request to the ASA from the United States Navy for the preparation of a guide to exposure of sensitized film under various conditions all over the world for use by the Armed Services. Such favorable reports were received on the use of the Computer from the Armed Forces, and civilians who were unable to obtain photoelectric meters due to wartime shortages, the committee decided to revise it for peacetime use.

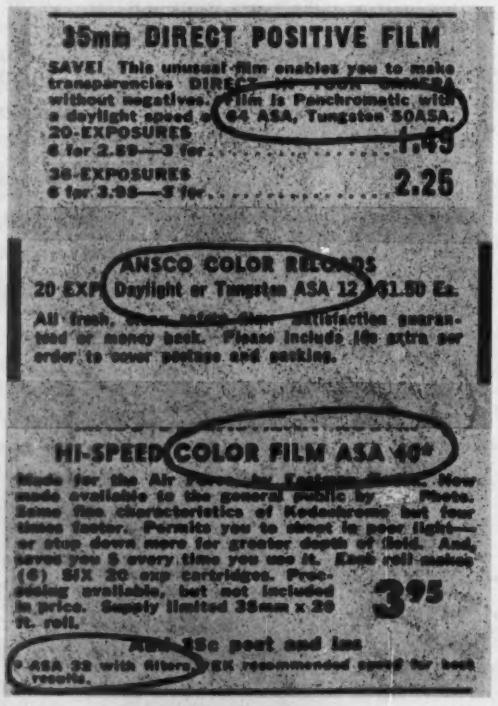

35mm DIRECT POSITIVE FILM
SAVE! This unusual film enables you to make
transparencies DIRECT
without negatives. Film is Panchromatic with
a daylight speed of 64 ASA, Tungsten 50ASA.
20-EXPOSURES
6 for 2.59—3 for 1.49
36-EXPOSURES
6 for 3.98—3 for 2.25
ANSCO COLOR RECORDS
20 EXP. Daylight or Tungsten ASA 12 $1.50 Ea.
All fresh, dated stock. Satisfaction guaranteed or money back. Please include 10c extra per order to cover postage and packing.
HI-SPEED COLOR FILM ASA 40*
3.95
ASA 32 with filters

Fig. 1. *These examples illustrate misuse of the American Standard Exposure Index and the symbol "ASA." They were taken from three different dealer advertisements in the March 1954 issue of a popular magazine on photography. See explanation on page 227.*

Abstracted from an article, "Making Standards Effective," published in Photographic Science and Technique, May 1954. Miss Locher is an engineering assistant on the staff of the American Standards Association, working with the Photographic Standards Board and with the Sectional Committees on Photography and Motion Pictures.

The new version of the Computer[1] (Z38.2.2-1949) presents to the photographer all the variables involved in good picture taking — weather, distance, time of year, time of day, sun and shade, film Exposure Index and even geographic latitude. For properly exposed pictures under all daylight conditions in any part of the world, it is merely necessary with ASA Exposure Computer to add together two numbers and then use the dial. Another improvement over the wartime edition is the additional information which has been included, which enables the photographer to use the Computer with reversal films intended for direct viewing and projection in both black-and-white and color. The wartime edition covered only black-and-white negative films.

Fig. 2. *These two dealer advertisements from the November 1953 issue of a U.S. camera magazine illustrate some violations of the American Standard Method for Determining Photographic Speed and Exposure Index. All four ASA numbers are manifestly the product of "pen and pencil" rating rather than sensitometric laboratory tests. The ASA symbol is used in four different ways that are expressly prohibited by the American Standard: (1) without further identification as ASA Speed or ASA Exposure Index, though the latter is intimated, (2) applied to color negative film though the standard is restricted to monochrome materials, (3) applied to reversal film though the standard is restricted to negative, (4) used with tungsten illumination though the standard is restricted to light of daylight quality. The unauthorized term "rating" is associated with the symbol ASA though the standard defines only ASA Speed and ASA Exposure Index. The figure 300 ASA is listed though the American Standard Exposure Index scale does not include any such figure and requires that rounded-off numbers be used in a specified series.*

Keeping American Standards Effective

A little-known service performed by the American Standards Association in connection with the use of these standards on film sensitivity is the close check the ASA keeps on the use of the term "Exposure Index" and the symbol "ASA" in published material. As stated in the scope of Z38.2.1-1947, the American Standard method of determining Speed and Exposure Index applies only to roll films, film packs, miniature camera films, sheet films and plates intended for the making of monochromatic, continuous-tone negatives for pictorial photography, exclusive of photography in the infrared. The standard does not apply to artificial light exposures or to process films and other graphic arts films and plates, and radiographic films. Likewise, the use of the designation "American Standard" or the initials "ASA" is prohibited should any factor be varied in the testing technique (that is, in the production of the density-log exposure curve). Following are excerpts from a few representative cases where the ASA has called attention to the unwitting misuse of the symbol and term in promotional material.

1. Several years ago it was noticed that a film carton for outdoor color film of the reversal type was being marketed under a label stating: "ASA Rating Daylight 10, 24 Exposures." The ASA called the distributor's attention to the fact that there is no such thing as an "ASA rating" for photographic film and it was not correct to use the initials "ASA" in connection either with a color film or a direct reversal film. It would be permissible to use the designation "Exposure Index," but the initials "ASA" should not be associated with that term in this instance. The distributor of the film thanked the ASA for the information supplied and agreed to discontinue the use of the cartons promptly and replace them with cartons giving the correct information.

2. In 1950, the announcement of a new photographic exposure computer was published with the statement — "Computer includes a table that lists ASA daylight and tungsten exposure indexes for all popular.... films"; The ASA pointed out to the organization which manufactured the computer that the American Standard Z38.2.1-1947 expressly restricts the use of the term "ASA Exposure Index" to data obtained in strict compliance with the standard. It further pointed out that the standard deals only with sensitometry using light of daylight quality. The term "Exposure Index," without the designation "ASA," however, could be used for tungsten ratings provided the standard was followed in all other respects.

3. Also in 1950 it was noticed that a roll film carton of a distributor stated — "ASA meter rating: 64 Daylight, 40 Tungsten." The ASA wrote to the distributor and directed his attention to the fact that no American Standard existed which covered "ASA Meter Ratings" and that the correct expression was "American Standard Exposure Index," or, if insufficient space was available on the carton, the shorter form — "ASA Exposure Index" could be used.

This particular distributor was especially grateful for the information supplied and expressed regret that a technical error had been made. He agreed to correct the cartons on the next printing.

4. In December 1952, attention of the editor of a popular photography magazine was called to misuse

[1] See Correct Exposure for Every Latitude," J. W. McNair. Photographic Science and Technique, Vol 17, No. 9 (September 1951) p 96.

of the ASA symbol in connection with reversal type film and illumination other than daylight.

In this instance, and in additional instances involving other publications, the misuse was not in the advertising columns but in the editorial matter. As usual, the utmost cooperation was pledged in preventing recurrences and the ASA was thanked for its educational efforts which it hopes will lead to proper use of American Standards.

5. A midwest manufacturer misused the symbol ASA on an exposure calculator mounted on amateur motion picture cameras using reversible type films. First the symbol was incorrectly associated with the term "speed" when actually "Exposure Index" was intended. Later an incorrect use of the ASA symbol in connection with reversible films was averted by the timely advice of the American Standards Association.

6. Even the prominent manufacturers of photographic film have slipped occasionally and published incorrect references to ASA Exposure Indexes due to overzealous copy writers in their advertising departments and the efforts of agency personnel who are unfamiliar with the American Standard Z38.2.1.

Other similar cases continue to cross the desk of the technical director of the American Standards Association. When these misuses of the American Standards or the registered initials "ASA" are pointed out, there always is noticed a real willingness to cooperate in the correct use of American Standards.

It is hoped that as the years pass more and more of the individuals and firms concerned with progress in photography will avail themselves of the services of the ASA, extending the use of standards which are voluntary, not mandatory, and which are so representative of the American way of life.

Cranwell Receives Award

James L. Cranwell, *vice-president, The Pennsylvania Railroad Company (right), is shown receiving a scroll citing him for leadership and guidance in advancing national voluntary standards. The award was made June 8 by Roger E. Gay (left), president, American Standards Association, at a luncheon meeting of ASA's Board of Directors. Mr Cranwell is a member of the Board representing the Association of American Railroads.*

AMERICA

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review — Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Boards — Approve standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.

Building

American Standards Published —

Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units, Specifications for, ASTM C126-52T; ASA A101.1-1954 $0.25

Inorganic Aggregates for Use in Interior Plaster, Specifications for, ASTM C35-53T; ASA A107.1-1954 $0.25

Granite Block for Pavement, Specifications for, ASTM D59-53; ASA A37.35-1954 (Revision of ASTM D59-39; ASA A37.35-1948) $0.25

Sponsor: American Society for Testing Materials

In Construction Standards Board —

National Plumbing Code, A40.8

Sponsors: American Public Health Association; American Society for Testing Materials

Project requested —

Installation of Ceramic Tile

Requested by: Miracle Adhesives Corporation; Tile Council of America

Withdrawal being considered —

Steel Reinforcing Bars, A47-1932

Sponsors: Commodity Standards Division of the Department of Commerce; Concrete Reinforcing Steel Institute

Plumbing Code, A40.7-1949

Sponsors: American Public Health Association; American Society for Testing Materials

Chemical Industry

In Board of Review —

Methods for Chemical Analysis of Yellow, Orange and Green Pigments Containing Lead Chromate, and Chromium Oxide Green, ASTM D126-50T; ASA K58.1 Revision of ASTM D126-36; ASA K58-1941)

Sponsor: American Society for Testing Materials

In Miscellaneous Standards Board —

Pure Para Red Toner, Light, Specifications for, ASTM D475-49; ASA K49.1 (Revision of ASTM D475-41; ASA K49-1941)

Method of Test for Acetone Extract in Black Pigments, ASTM D305-51; ASA K55.1 (Revision of D305-31; ASA K55-1941)

Sponsor: American Society for Testing Materials

N STANDARDS . . . Status as of June 11, 1954

Consumer

In Board of Review —

Methods of Testing Felt, ASTM D461-53; ASA L14.52 (Revision of ASTM D461-51; ASA L14.52-1953)
Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Milled Toilet Soap, Specifications for, ASTM D455-53T; ASA K60.6 (Revision of ASTM D455-48; ASA K60.6-1949)
Sponsor: American Society for Testing Materials

In Consumer Goods Standards Board—

Definitions of Terms in Relation to Textile Materials, ASTM D123-53; ASA L14.12 (Revision of ASTM D123-52; ASA L14.12-1953)
Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Withdrawal being considered —

Osnaburg Cement Sacks, Specifications and Methods of Test for, ASTM D205-39; ASA L14.15-1949

Woolen Yarns, Specifications and Methods of Test for, ASTM D403-48T; ASA L14.21-1949

Worsted Yarns, Specifications and Methods of Test for, ASTM D404-48T; ASA L14.22-1949
Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Electrical

American Standards Published —

Method for Determining Flutter Content of Sound Recorders and Reproducers, Z57.1/68-1954 $0.75
Sponsor: Institute of Radio Engineers

Flexible Cord and Fixture Wire, C33.1-1954 (Revision of C33.1-1953)
Sponsor: Underwriters' Laboratories, Inc

Covers the requirements for flexible cord and fixture wire, except armored cords, for use in accordance with the American Standard National Electric Code, C1. This American Standard is the same as the Underwriters' Laboratories' standard of the same name, except that ASA approval does not cover paragraphs 5 and 6, and 386 to 480, incl, of the UL publication.

Contains complete requirements and tests for flexible cords and single-conductor fixture wires made of 21 different classes of insulating material.

In Electrical Standards Board —

Definitions of Terms for Antennas and Waveguides, C16.21
Sponsor: Institute of Radio Engineers

American Standard Withdrawn —

Power and Audio Transformers and Reactors (Home Receiver Replacement Type), C16.9-1943
Sponsor: Institute of Radio Engineers

Mechanical

American Standards Published —

Double-Pitch Power Transmission Roller Chains and Sprockets, B29.3-1954 $2.00

Double-Pitch Conveyor Roller Chains, Attachments and Sprockets, B29.4-1954 $2.00

Attachments for Transmission Roller Chains, B29.5-1954 $1.00
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

In Mechanical Standards Board —

Malleable Iron Detachable Link Chain and Attachments, B29.7

Steel Detachable Link Chain and Attachments, B29.6
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Spindle Noses for Tool Room Lathes, Engine Lathes, Turret Lathes, and Automatic Lathes, B5.9 (Revision of B5.9-1948)

Machine Pins, B5.20 (Revision of B5.20-1947)
Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Manufacturers Association; Society of Automotive Engineers

Five Quart and One Gallon Round Cans, Requirements for, B64.2

Oblong Oil Cans, Requirements for, B64.3

Grease Cans, Requirements for, B64.5
Submitted by: General Conference

Motion Pictures

American Standards Published —

Dimensions for 16-mm Film Perforated One Edge, PH22.12-1954 (Revision of Z22.12-1947) $0.25

Dimensions for 8-mm Motion Picture Film, PH22.17-1954 (Revision of Z22.17-1947) $0.25

35-mm Sound Motion Picture Film, Usage in Camera, PH22.2-1954 (Revision of Z22.2-1946) $0.25

8-mm Motion Picture Film, Usage in Camera, PH22.21-1954 (Revision of Z22.21-1946) $0.25

8-mm Motion Picture Film, Usage in Projector, PH22.22-1954 (Revision of Z22.22-1947) $0.25

35-mm Sound Motion Picture Film, Usage in Projector, PH22.3-1954 (Revision of Z22.3-1946) $0.25

Dimensions for 35-mm Motion Picture Positive Raw Stock, PH22.36-1954 (Revision of Z22.36-1947) $0.25

Dimensions for 16-mm Film, Perforated Two Edges, PH22.5-1954 (Revision of Z22.5-1947) $0.25

A and B Windings of 16-mm Film, Perforated One Edge, PH22.75-1954 $0.25

Aperture Calibration of Motion Picture Lenses, PH22.90-1954 $0.50

Dimensions for 35-mm Motion Picture Short-Pitch Negative Film, PH22.93-1954 $0.25

Slides and Opaques for Television Film Camera Chains, PH22.94-1954 $0.25
Sponsor: Society of Motion Picture and Television Engineers

Office Equipment

In Miscellaneous Standards Board —

Maximum Electrical Leakage of Dictating Machines, X2.5.17/234

Length of Cables for Office Dictation Machines, X2.5.19

Non-Carbonized, Single-Ply, Adding Machine Paper Rolls, Specifications for, X2.4.2

Definition of Posture Chair, X2.1.4/238

Operating Voltage Range of Office Dictating Equipment, X2.5.16/232
Sponsor: National Office Management Association

Photography

American Standards Approved —

Method for Indicating the Stability of the Images of Processed Black-and-White Films, Plates, and Papers, PH4.12-1954 Revision of Z38.8.17-1948)

Method for Determining the Chemical Resistivity and Photographic Inertness of Constructional Materials for Processing Equipment, PH4.13-1954

Photographic Grade Citric Acid, Anhydrous, Specification for, PH4.107-1954

Photographic Grade Sodium Bromide, Specification for, PH4.207-1954
Sponsor: Photographic Standards Board

In Miscellaneous Standards Board —

Photographic Grade Sodium Tetraborate, Decahydrate, (Borax), PH4.230 (Revision of Z38.8.230-1948)

Dimensions for 70-mm Perforated Film for Cameras Other Than Motion Picture Cameras, PH1.20

Method for Determining Spectral-Sensitivity Indexes and Group Numbers for Photographic Emulsions, PH2.6 (Revision of Z38.2.4-1946)

Photographic Grade Sodium Metaborate, Specification for, Octahydrate, PH4.231

Photographic Grade Sodium Tetraborate, Pentahydrate, Specification for, PH4.233
Sponsor: Photographic Standards Board

Colonel W. R. McCaffrey

The American Standards Association announces with regret the sudden death on July 11 of Colonel W. R. McCaffrey, General Manager of the Canadian Standards Association.

Colonel McCaffrey had been with the Association since 1937. During that time he developed an effective and vigorous organization. He also encouraged active friendship and cooperation between Canadian and U.S. standardization groups through liaison representation on committees developing standards that affect industry in both countries. He himself served as a special liaison member of the various Standards Boards of ASA and on the Standards Council.

What's New on American Standard Projects

Code for Pressure Piping, B31 —

Sponsor: The American Society of Mechanical Engineers.

INTERPRETATIONS
Submitted by the Sponsor
Case No. 16

Inquiry: Are the requirements contained in Section 9.3, Specific Minimum Requirements for Refrigerant Pipe and Tubing, of the new American Standard Safety Code for Mechanical Refrigeration, B9.1-1953, also required by Section 5, Refrigerant Piping of American Standard B31.1-1951, Code for Pressure Piping?

Reply: The Refrigeration Section of the Code for Pressure Piping has taken action to bring the requirements of paragraph 516 into harmony with the new 1953 edition of the B9 Safety Code for Mechanical Refrigeration.

Until such time as a new edition of the Code for Pressure Piping is issued, the following wording of paragraph 516 should be complied with:—

516 Specific Minimum Thickness Requirements for Refrigerant Pipe and Tubing.

(*a*) STEEL AND WROUGHT-IRON PIPE. Standard wall steel or wrought-iron pipe may be used for design working pressures not exceeding 300 psig, provided lap-welded, electric-resistance-welded or seamless pipe is used for sizes 2 in. and larger and extra strong wall pipe is used for liquid lines for sizes 1½ in. and smaller, conforming to ASA B36.10.

(*b*) STANDARD PIPE SIZE BRASS COPPER PIPE AND TUBING. Standard pipe size copper and red brass (not less than 80 percent copper) may be used and shall conform to ASTM Specification B-42 for copper pipe and ASTM Specification B-43 for red brass pipe.

(c) WATER TUBE SIZE HARD COPPER TUBING. Water tube size hard copper tubing used for refrigerant piping shall conform to ASTM Specification B-88 Types K or L for dimension and specifications except that copper tubing with outside dimensions of ¼ in. and ⅜ in. shall have a minimum nominal wall thickness not less than 0.030 in. and 0.032 in., respectively.

(*d*) SOFT ANNEALED COPPER TUBING. Soft annealed copper tubing used for refrigerant piping shall not be used in sizes larger than ⅞ in. outside diameter (¾ in. nominal). Soft annealed copper tubing shall conform to ASTM Specification B-68 or ASTM Specification B280T and the minimum nominal wall thickness shall be as follows:

Outside diameter, in.	Wall thickness, in.
¼	0.030
⅜	0.032
½	0.032
⅝	0.035
¾	0.042
⅞	0.045

(*e*) SMALL COPPER TUBING EXCEPTION. Hard copper tubing and soft annealed copper tubing up to and including ½-in. outside diameter used in factory assembled piping may have wall thicknesses 0.004 in. less than the thicknesses specified in Paragraphs (*c*) and (*d*).

Table 40 — List of Material Specifications

Add under TUBING — Non-ferrous:

Seamless copper tube for refrigeration field service ASTM B 280T

Table 42 — Allowable S values to be used in Formula 13 for Pipe and Tubing in Refrigerating Systems.

Change last three designations as follows:

** Brass pipe, seamless red brass	ASTM B43	7000 lb
** Copper pipe, seamless	ASTM B42	6000 lb
** Copper tubing, seamless	ASTM B88 ASTM B68 ASTM B280T ASTM B75	6000 lb

** Brass pipe, copper pipe seamless, copper tubing seamless, temperature limit 250 F.

ASTM B75 not recommended for refrigerant piping.

Power Switchgear, C37 —

Sponsor: Electrical Standards Board

In the May 3, 1954 issue of *Electrical World,* six scientists closely associated with the manufacture and use of power circuit breakers offer a proposal for changing one of the important principles on which American Standards for circuit breakers are at present set up. The scientists are members of a Working Group of the American Institute of Electrical Engineers. Their suggestion is to provide a simpler method of rating the short circuit capability of power circuit breakers. If the suggestion is accepted they believe it would facilitate the task of switchgear application engineers by clarifying terms often poorly understood and by eliminating occasions for mistakes. Moreover, they declare, it would supplant the present multiplicity of ratings, such as, kva, momentary, making, latching, and interrupting current, by merely prescribing "rated short circuit current."

A new method that combines these concepts in a single rating is proposed in AIEE Paper No. 54-134, describing the work of the Switchgear Committee and its Working Group on Methods of Rating Power Circuit Breakers. Two years' work remains to be done, however, the group reports, before it will be ready to recommend specific changes in the present standards.

The working group believes that the proposed method of rating could become compatible with the present Z rating method set up by the International Electrotechnical Commission and used by European countries. The proposed method rates the circuit breaker according to the short circuit characteristics of the system. The IEC method, on the other hand, rates the breaker according to the symmetrical component of the fault current at the instant of contact separation. The methods are not widely different, the AIEE group reports.

The proposal is published in *Electrical World* under the title: *"Problem:* Should ASA Basis for Rating Power Circuit Breakers Be Changed?

Automatic null-balancing electrical measuring instruments *are being standardized by subgroup 3 of Sectional Committee C39 on Electrical Measuring Instruments. At a two-day meeting of the group June 10 and 11 in New York a draft of the proposed standard was considered in detail.*

(Left to right, above)—C. J. Zeller, Consolidated Edison Co of N. Y.; W. H. Tucker, General Electric Co; Earl F. Adams, Weston Electrical Instrument Corp; J. W. Percy, U.S. Steel Corp; S. David Hoffman, American Standards Association; G. L. Broomell, Chairman, Leeds and Northrup Co; Warren H. Brand, Carbide and Carbon Chemical Co; A. W. Jacobson, The Bristol Co; G. F. Walter, Public Service Electric and Gas Co; A. J. Petzinger, Westinghouse Electric Corp; E. E. Scott, Armed Services Electro-Standards Agency; C. A. Vogelsang, Brown Instrument Division of Minneapolis-Honeywell.

Proposal: AIEE Working Group Offers Case for Simpler Rating and Application."

Members of the Working Group that made the proposal are: C. A. Woodrow, *Chairman,* AIEE Working Group on Circuit Breaker Rating Methods, General Electric; Otto Naef, Member, American Gas & Electric Service; R. C. Van Sickle, Member, Westinghouse Electric Corp; W. F. Skeats, Member, General Electric Co; C. L. Killgore, Member, U.S. Bureau of Reclamation; R. L. Webb, Member, Consolidated Edison Co of N.Y.

Photographic Sensitometry, PH2 —

Sponsor: Photographic Standards Board

International recommendations for determining and expressing the light sensitivity of photographic film in relation to camera shutter speeds and for diffuse transmission density have just been approved by the International Organization for Standardization. They are based on corresponding American Standards. They are intended as recommendations for national standards bodies to use in their own national standards as a means of bringing about greater interchangeability and coordination among the standards of the various countries.

The new ISO Recommendations are Diffuse Transmission Density, ISO/R 5 and Method for Determining Photographic Speed and Exposure Index, ISO/R 6. The American Standard on speed and exposure index was revised recently and minor changes were made in line with suggestions from national standards bodies of other countries. This is now known as the American Standard Method for Determining Photographic Speed and Exposure Index, PH2.5-1954. The American Standard Diffuse Transmission Density is identified as Z38.2.5-1946 and is currently under revision.

Interpretation Committee Named

Widespread use of the identifying letters "ASA" in connection with photographic film and exposure meters inevitably brings in questions on how the American Standard Method for Determining Photographic Speed and Exposure Index should be interpreted.

As a result of such questions, a special subcommittee has been appointed to help interpret the standard, and review problems in connection with its use. The subcommittee will advise Sectional Committee PH2, Photographic Sensitometry, on how to improve and revise the 1954 edition of this standard method. The questions that come to it and the studies it makes, may bring to the subcommittee's attention other problems that should be standardized. It will be responsible for bringing these to the sectional committee.

Mr J. L. Tupper, who is affiliated with the Research Laboratories of the Eastman Kodak Company, will act as Chairman, assisted by Messrs. M. G. Anderson (Ansco), Raymond Davis (National Bureau of Standards), S. B. Fulweiler (Master Photo Dealers' and Finishers' Assn), R. L. Howard (Westinghouse Lamp Division), Peter Krause (Society of Photographic Engineers), A. G. Stimson (Photographic Society of America) and J. P. Weiss (E. I. du Pont de Nemours & Company). It is expected that additional members will be added to the committee as needed.

Photographers with picture-taking vacations at hand will be interested in the explanation of the well-known phrase "ASA Exposure Index" in the article, "How to Use 'ASA' in Photography," page 226.

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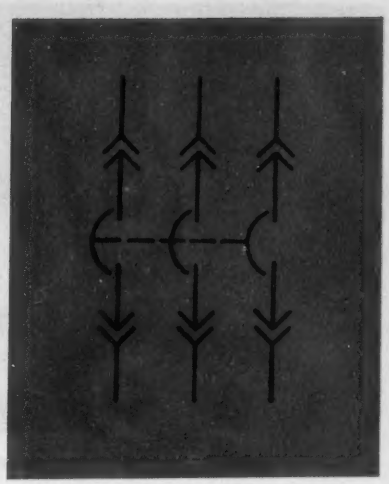
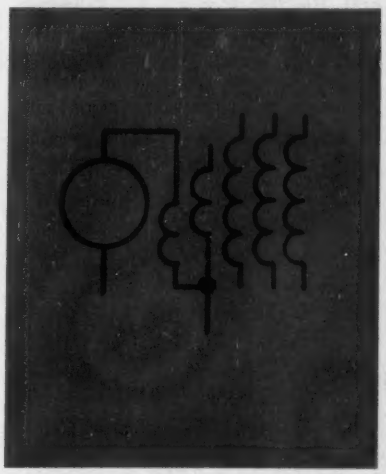


7.4.3 3-pole circuit breaker, draw-out type

14.8.8 3-conductor polarized connector with male contacts



35.9.23 Regulating generator (rotary amplifier) shunt wound with compensating field winding nut without short-circuited brushes